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01.	4114	B. Tech. (Electronics & Communication Engineering)
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G. G. V. Bilaspur (C.G.)

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A

Major Project Report

On

"OBJECT DETECTION USING YOLOv8"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

By

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Under the guidance of

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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)

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We hereby certified that the work which is being presented in the B. Tech Major Project report entitled "**OBJECT DETECTION USING YOLOv8** "in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh, India is an authentic record of my own work carried out during a period from December 2023 to May 2024 under the supervision of **Dr. Anil Kumar Soni (Assistant Professor)** ECE department .

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CHAPTER-1

INTRODUCTION

Industrial settings are often locations of employment where large pieces of equipment, tools, and machinery are employed to produce goods or render services. These settings are common in a number of sectors, including manufacturing, construction, mining, and transportation. Loud noise, dust, heat, dangerous chemicals, and large machinery are frequently present in industrial settings. If not effectively handled, these variables might endanger the health and safety of employees.

Numerous risks are frequently encountered in industrial settings. Some of the most serious dangers include the following:

Falls: Working at heights or on uneven surfaces frequently results in falls, which are a primary cause of injuries in industrial settings. falls can cause deaths, brain injuries, and shattered bones.

Electrocution: Most industrial settings include electrical dangers, and workers who come into touch with live wires or broken machinery risk being electrocuted. Burns, heart arrest, and death can all result from electrocution.

Burns: Burns may develop as a result of contact with hot surfaces, chemicals, or flames. Burns may leave lifelong scars and render a person disabled.

Exposure to harmful substances: Industrial workers may be exposed to a variety of dangerous substances, such as poisonous chemicals, gases, and fumes. Respiratory issues, malignancies, and other ailments can be brought on by exposure to these compounds.

Equipment-related accidents: Heavy machinery and equipment are frequently used in industrial situations. accidents involving equipment can cause deaths, amputations, and crushing injuries.

Because it maintains the welfare of employees and tourists in industrial settings and can help avoid accidents, diseases, and injuries, industrial safety is essential in the contemporary environment. The likelihood of accidents and risks has grown along with technological innovation and the complexity of industrial operations. Heavy equipment, dangerous substances, and other potential dangers are frequently present in industrial sites and can seriously hurt employees and visitors if not adequately controlled.

Additionally, maintaining industrial safety helps the organization itself as well as the health of employees and visitors. Lost productivity, higher insurance rates, and legal obligations can all be consequences of accidents and injuries. On the other side, a safe working environment may boost output, lower absenteeism, and boost employees' morale and motivation.

Several safety precautions may be adopted in the current situation to guarantee industrial safety. These are a few of them.

A

Major Project Report

On

"DETECTION OF CYBER BULLYING USING MACHINE LEARNING"

Submitted in the partial fulfillment for the award of degree of

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By

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CHAPTER-1

INTRODUCTION

Most chat applications in the internet like WhatsApp, Messenger or other social networking apps offering chat communication tools for text messages, media data sharing, web data sharing etc. In current trend many social networking sites created and providing services of communications, multi-media services, e-commerce etc immensely. For examples twitter social media provide major services of micro-blogging massively, it has more than 700 million users and 400 million micro-blogs produces per day. According to research survey many more than 30% of dummy or duplicate or fake accounts are present in all social media services like twitter, facebook, insta etc [10]. But in the current social sites not focus on services like tracking the user behavior of anonymous behavior. In current system, social network sites need to focus the user microblogs and need to capture the user behavior whether his/she anonymous user or not. Few survey's providing concepts to tracking the attackers like using profile matching techniques and network based techniques etc. But in real-time to apply those concepts in social network is less practical. Crawling the user information from the user micro blogs is also less practical. Anonymous Users can easily manipulate the public profile information. In social networks user may share their messages by using the chat applications. For every social networking site has their own chat applications, for this facebook is main example. And another way is sharing the multimedia data like images or videos. For this Facebook and Instagram best examples. For communication between users chat applications will most useful for share their information, thoughts, views etc. But in the same way it may also cause the security loophole of user's security which is cyber bullying. Such textbased content may security threat to the users because of the people can share cyber bullying words to the users with their fake accounts. [11], [12]. Based on these disadvantages detection malicious users is active topic in the study of social media.

1.1 Overview

Nowadays, people use online social media to connect with online social circles and sharing messages, documents, images, and videos. Billions of people use some of the most popular social networking apps, including Facebook, Twitter, etc. Millions of posts and messages

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By

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1.INTRODUCTION

1.1 Semiconductor Devices: A Brief History

Time has appeared that human has accomplished more tip top life by the utilize of present-day innovation. Technology that helps us to understand the need of basic nature and take us even into deep space for exploration and research. Smartphones, pc, laptops etc. Has make our life lot easier. And all of these technology are based on semiconductor devices. All these life supporting gadgets are getting smaller and smaller day by day and their power consumption level is also decreasing making them very power efficient. It's all started in 1925 when great scientist Julius Edgar Lilienfeld (1881-1963) has proposed an element which has a resemblance like todays MOS Transistor for which he has applied for patent in 1930. Time has shown that human has achieved more elite life by the use of modern technology. But the actual device made in 1960 by Kahng and Atilla which they call MOSFET (metal oxide semiconductor field effect transistor). In 1958 first time the idea of integrated circuit (IC) is presented by Jack Kelby at Taxes Instruments and Robert Noyce from the Fairchild Corp. fabricated the first IC (S-R flip flop) as shown in Fig. 1.1. Then came Gordon Moore who is also a co-founder of Intel corp. said that the number of transistors doubles approximately every 18 months which is shown in Fig.1.2. Moore's extrapolation has been correct for three decades. In year 1962 world saw the generation of first logic family and its name as TTL. Then it was it was Intel that introduce first transistor in year 1972 which is made up of two thousand p-MOS transistors. Slowly the number of transistor grows exponentially following Moore's law and soon n-MOS has been used to make processors. But they are ruled out due to higher dynamic power dissipation. Then came the CMOS technology which brings tremendous changes in processor manufacturing as well as other semiconductor technology. It's possible only because of low power consumption of CMOS and its higher efficiency. With the introduction of CMOS, it became easier to fabricate more numbers of chip in a given area so the production of device moves from small scale integration (SSI) to very large-scale integration (VLSI). Now the realm of technology is entering the Nano technology. With CMOS technology it become possible to reduce the device power consumption and it is possible because of the very powerful theory of scaling. With scaling it became possible to 2reduce size of device dimensions by reducing basic parts of transistor like channel length, channel thickness etc. scaling also make it possible to reduce the size of voltage supply. A semiconductor working group which has prepared the road map for the scaling of device and reduction of power consumption called International Technology Roadmap for Semiconductor (ITRS) has prepared a road map which tell us that in year 2013 we will reach to 22 nm technology node where device channel length will be less than 10nm.

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We hereby certified that the work which is being presented in the B Tech Major Project report entitled "**EMAIL SPAM DETECTION USING MACHINE LEARNING**" in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh ,India is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of **Dr. Sudakar Singh Chauhan Associate Professor** ECE department .

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CHAPTER-1

1.1 Introduction:

Spam is become a serious issue when it comes to online communication. Approximately 55% of all emails are reported as spam, and the percentage has been continuously rising. Unsolicited bulk emails, or spam, have made people use email more frequently since it's a free and convenient way to transmit unsolicited advertisements or garbage newsgroup postings. This opportunity has been widely taken advantage of by careless groups, filling millions of people's mail boxes worldwide [1].

Regarding the intolerant substance of some communications, spam has been a big worry. It's also a waste of time. The end user runs the risk of inadvertently erasing valid emails. Furthermore, spam had an effect on the economy, which prompted some nations to pass laws.

The course of incoming mail or messages whether they go directly to the spam folder or into the inbox is determined by text classification. It is the process of classifying text based on the information it contains. Text is arranged, structured, and classified using it. It can be carried out automatically or manually. Compared to manual technique, machine learning automatically classifies the text considerably faster. Pre-labelled text is used by machine learning to discover the many relationships between text segments and their output [2].

It can be carried out automatically or manually. Compared to manual technique, machine learning automatically classifies the text considerably faster. Pre-labelled text is used by machine learning to discover the many relationships between text segments and their output. Each text was converted to a numerical representation in the form of a vector using feature extraction [3].

Text classification plays a crucial role in organizing the disorganized and disorderly characteristics of text, including papers and spam messages, in an economical manner [4]. Machine learning has the potential to improve real-time precision and speed up the hard human process of massive data analysis.

In this project, the spam message in an email is identified using machine learning algorithms. Through machine learning, computers can acquire new skills without requiring them to be specifically programmed for job.

A

Major Project Report

On

"Multichannel Biometric Recognition and Authentication using Machine Learning"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

By

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B. Tech, VIII Semester

Under the guidance of

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SESSION: 2023-24

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Chapter 1

Introduction

1.1 Biometric Authentication

The Biometric Authentication system plays an imperative part in any Organization for security and various operations. Bio-metric authentication is a method used to verify the identity of individuals based on their unique physical or behavioral characteristics. Unlike traditional methods such as pass- words or PINs, which can be forgotten, stolen, or shared, biometric authentication relies on distinctive traits that are inherently linked to an individual. There are so many Biometric Authentication systems accessible in advertising like biometrics, fingerprint scanners, and iris scanners but these all have exceptionally high costs for giving and maintaining the database for all the understudies. Here we are utilizing the Android smartphone with the help of the WiFi and confront acknowledgment procedure for making the participation for the students, the participation is captured for each hour and it is stored in the database for giving the attendance and making reports of the understudy. Another part this project includes is Wifi Based Verification. Wi-Fi-based authentication is a method of verifying the identity of users accessing a network using their Wi-Fi-enabled devices. This authentication process typically occurs when a user attempts to connect to a Wi-Fi network, either in a public hotspot, corporate environment, or home network.

1.2 Literature Review

In[1]"Enhanced Biometric Authentication System Using Deep Learning and Blockchainfor Secure Access Control" by A. Ahmed et al. (2022): This paper proposes an enhanced biometric authentication system that combines deep learning techniques with blockchaintechnology to ensure secure access control.

A

Major Project Report

On

PARKINSON'S DISEASE

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

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SESSION: 2023-24

CHAPTER-1

1.1 Introduction:

Parkinson's disease is a neurodegenerative condition that affects dopamine neurons in the brain, impairing movement and causing tremors, stiffness, and shaking. This methodology gathers a vast amount of data from people who have already had an impact. A machine learning algorithm then compares the user-input data with the historical data to determine whether the user is still affected. Usually starting slowly, non-motor symptoms increase in frequency as the illness progresses. Tremor, rigidity, slowness of movement, and behavioral issues are the most obvious early symptoms of Parkinson's disease (PD). Apathy, sadness, and anxiety are common in many PD patients. Symptoms are the primary basis for diagnosis in most cases, with motor symptoms being the most common complaint. To help rule out other disorders, tests like neuroimaging (magnetic resonance imaging, or imaging to look at dopamine neuronal dysfunction known as DaT scan) can be utilized. Approximately 1% of adults over 60 have Parkinson's disease. The disease usually affects them. The frequency of male-to-female infection is approximately 3:1. It is known as early-onset Parkinson's disease (PD) when it first manifests in those under 50. Parkinson's disease claimed the lives of around 117,400 people worldwide by 2015. It affected 6.2 million people. After a diagnosis, the typical life expectancy is seven to fifteen years.

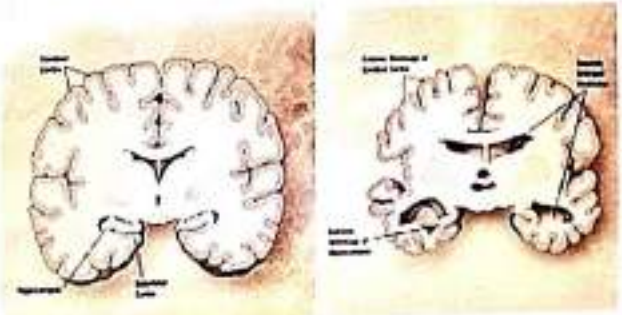

Figure 1.1 Parkinson's disease

WHO IS AFFECTED BY PARKINSON'S DISEASE?

A

Major Project Report

On

"ALZHEIMER'S DISEASE DETECTION BASED ON DEEP LEARNING USING MR IMAGES"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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CHAPTER-1

1.1 INTRODUCTION

A progressive neurological disease, Alzheimer's disease (AD) is the primary cause of dementia in older persons. It is typified by a progressive deterioration of cognitive abilities, such as language, logic, memory, and daily task performance. For affected people and their families, early detection of Alzheimer's disease is essential for controlling symptoms, reducing the illness's course, and enhancing quality of life. In the US, 6.5 million adults 65 years of age and older have Alzheimer's disease. Over 70% of them are 75 years of age or older. 60% to 70% of the approximately 55 million persons with dementia globally are thought to have Alzheimer's disease.

It occurs because of the build-up of amyloid-beta peptide (Aβ) in the brain's most damaged areas, the neocortical structures and medial temporal lobe. When Alois Alzheimer examined the brain of his first patient, who experienced memory loss and a change in personality before to death, he found amyloid plaques and a tremendous loss of neurons. He classified the patient's condition as a terrible disease of the cerebral cortex. In his psychiatric manual, the eighth edition, Emil Kraepelin initially referred to this medical condition as Alzheimer's disease.

Brain disorders such as Alzheimer's disease (AD) or other conditions like infections, intoxications, abnormalities in the pulmonary and circulatory systems, which reduce the amount of oxygen reaching the brain, deficiencies in nutrition, low levels of vitamin B12, tumors, and so on can all lead to a progressive loss of cognitive functions.

Alzheimer's disease currently has no known cure, while there are medications that can help with symptoms. In addition to highlighting the recent development of compounds that could prevent or treat AD by targeting several pathogenic mechanisms, such as Aβ and tau aggregation, misfolding, inflammation, oxidative damage, and others, this review aims to provide a brief overview of AD diagnosis, pathology, causes, and current treatments.

A

Major Project Report

On

"EPILEPTIC SEIZURE DETECTION USING DEEP LEARNING WITH EEG DATA"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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CHAPTER-1

1.1 INTRODUCTION

Seizures are sudden, unpredictable electrical abnormalities in the brain that occur often in people with epilepsy [1]. These seizures can seriously impair a person's quality of life and provide difficult medical treatment issues. Effective seizure control and better patient outcomes depend on early detection and intervention [2]. Conventional techniques for identifying epileptic seizures mostly depend on skilled doctors visually examining electroencephalogram (EEG) recordings [3]. Nevertheless, this procedure is subjective, time-consuming, and might not always be possible, especially in situations involving real-time [4]. As a result, there is increasing interest in creating machine learning-based automated seizure detection systems.

It is now possible to gather and store large volumes of EEG data in the .CSV file because of The advancement of digital EEG technology has made it easier to work with CSV (comma-separated values) format [5]. These. CSV files contain time-series data that shows electrical activity recorded from several brain areas [6]. Researchers want to apply machine learning to accurately identify and classify epileptic episodes by utilizing this wealth of data. An additional consequence is status epilepticus, which is defined by a prolonged seizure or a series of seizures in which the patient does not regain consciousness in between seizures [7]. Status epilepticus is a medical emergency that requires immediate attention. If neglected, it can result in significant brain damage or possibly death. It's crucial to remember that the majority of epileptics can lead happy lives if they have access to appropriate care and treatment, and that epilepsy generally has a low overall death rate [8]. But individuals with epilepsy need to work closely with medical doctors to minimize risks and manage the condition effectively. The inability of brain neurons to regulate electrical signals in the brain is the source of seizures, and due to the condition's seriousness and complexity, many researchers have been drawn to investigate it. Seizures typically coexist with issues related to mobility, sensory, or thought processes. Over thirty percent of epileptic people still have uncontrollable seizures even after being treated with antiepileptic drugs [9]. The seizures are separated into two categories based on the areas of the brain that become activated throughout the episode: they are partial and generalized.

A

Major Project Report

On

Medicine Recommender System

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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I hereby certified that the work which is being presented in the B Tech Major Project report entitled **"Medcine Recommender System"** in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru GhasidasVishwavidyalaya, Central University Bilaspur,Chhattisgrah INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of **Mrs. Pragati Patharia,** Assistant Professor, ECE department .

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CHAPTER 1: INTRODUCTION TO MEDICINE RECOMMENDER SYSTEM

Medicine Recommender System: Enhancing Healthcare Decision-Making

Background:

In today's dynamic healthcare landscape, where information is readily accessible and medical options are abundant, individuals face the challenge of navigating through a multitude of choices to make informed decisions about their health and well-being. With the advent of digital technologies and the exponential growth of medical data, there arises a pressing need for innovative solutions to simplify and personalize healthcare recommendations. The Medicine Recommender System emerges as a promising tool in this context, leveraging the power of data analysis and artificial intelligence to offer tailored medication suggestions tailored to individual health profiles and medical needs.

Motivation:

The motivation behind the development of a Medicine Recommender System stems from the recognition of the inherent complexity within the field of healthcare. Medical conditions vary widely among individuals, and the efficacy and safety of medications can be influenced by numerous factors such as age, gender, genetics, lifestyle, and concurrent health conditions. As such, there is a compelling need for a personalized approach to healthcare recommendations that accounts for these diverse variables. By harnessing advanced data analytics and machine learning techniques, the Medicine Recommender System seeks to streamline the process of medication selection, enhance patient engagement, and ultimately improve healthcare outcomes.

Problem Statement:

The core challenge facing the development of a robust Medicine Recommender System lies in its ability to accurately analyze vast amounts of medical data and distill meaningful insights to support informed decision-making. The system must navigate through the intricacies of individual health profiles, including medical history, allergies, existing medications, and potential drug interactions, to generate personalized medication recommendations that prioritize patient safety and efficacy. Moreover, the system must be designed with a user-centric approach, ensuring accessibility, usability, and transparency in its recommendations. Addressing these challenges requires interdisciplinary collaboration between healthcare professionals, data scientists, and software engineers to develop a comprehensive solution that meets the diverse needs of patients and healthcare providers alike.

Objectives:

The primary objectives of the Medicine Recommender System project encompass several key components:

1. **User-Friendly Interface**: Develop an intuitive and user-friendly interface that allows individuals to input their medical information securely and efficiently. The interface should accommodate a diverse range of users, including patients, caregivers, and healthcare professionals, and provide clear guidance on data input requirements.

A

Major Project Report

On

Steganography

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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Chapter 1: Introduction

1.1 What is Steganography?

Steganography is the art and science of concealing information within other information, often in ways that are imperceptible to the untrained eye.

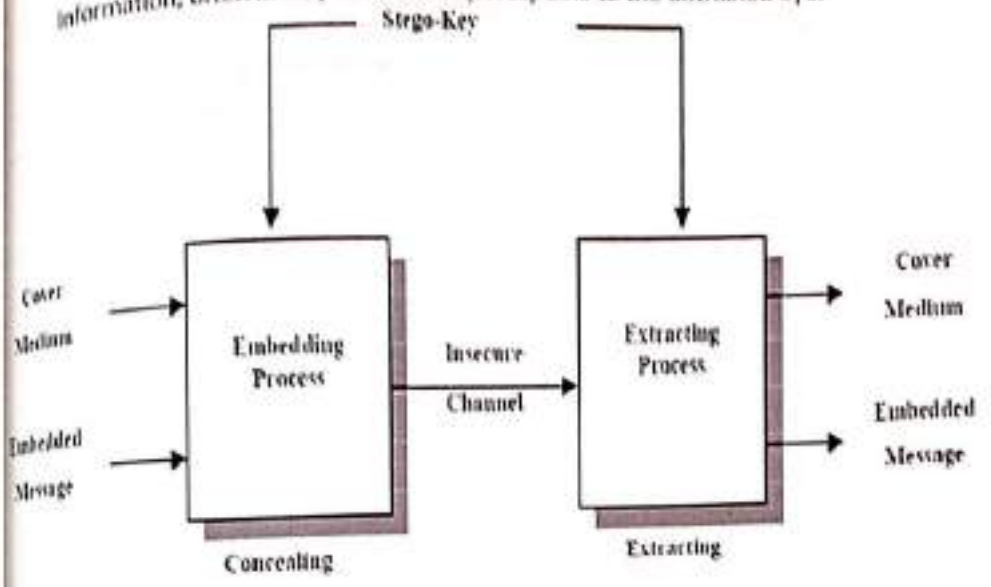

Fig. 1.1.1. architecture of steganography

Unlike cryptography, which focuses on obscuring the meaning of a message, steganography aims to hide the very existence of a message, making it appear as if nothing out of the ordinary is being transmitted.

Through the clever use of digital media such as images, audio files, or even the unused portions of computer files, steganographers can embed secret messages that blend seamlessly with their surroundings.

This makes steganography a powerful tool for secure communication, as the hidden information can be exchanged without drawing unwanted attention or suspicion.

Steganography is the practice of concealing a message, file, or data within another message, file, or data in such a way that the existence of the hidden information is not apparent to an observer.

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A

Major Project Report

On

"UNVEILING MESSAGES THROUGH IMAGE STEGANOGRAPHY"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

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CHAPTER 1

1.1 INTRODUCTION

In today's digital age, where information security is paramount, the need for robust and clandestine methods of data concealment has become increasingly crucial. Steganography, the art and science of hiding information within other data in such a way that it remains undetectable to unintended recipients, offers a powerful solution to this challenge. Among its various applications, image steganography stands out as a prominent technique for covert communication and data protection [1]. The essence of image steganography lies in embedding secret messages or data within digital images without perceptibly altering their appearance. Unlike cryptography, which relies on encryption to render messages unintelligible, steganography ensures that the existence of the hidden information remains imperceptible to anyone unaware of its presence. This covert communication technique finds applications in diverse fields such as military communications, digital watermarking, copyright protection, and covert surveillance, among others. By understanding the underlying concepts and methodologies, we aim to provide insights into the mechanisms employed for concealing data within images, as well as the methods used for extracting and decoding the hidden information. Throughout this report, we will examine various approaches to image steganography, including spatial domain techniques such as LSB (Least Significant Bit) insertion, recurrence space strategies like Discrete Cosine Transform (DCT), and advanced methods such as spread spectrum techniques and adaptive steganography algorithms. Each technique presents unique advantages and limitations, which we will thoroughly analyze to comprehend their efficacy and suitability for different scenarios. Moreover, we will explore the importance of robustness and security in image steganography systems, addressing concerns such as data capacity, imperceptibility, robustness against attacks, and computational efficiency. Additionally, we will discuss the ethical considerations surrounding the use of steganographic techniques and the legitimate suggestions related with their application. In conclusion, this project report endeavors to provide a comprehensive overview of image steganography, shedding light on its significance, methodologies, challenges, and practical implications. By delving into this fascinating field, we aim to contribute to the broader understanding of data security and covert communication techniques in the digital age [2].

A

Major Project Report

On

AUTOMATIC NUMBER PLATE DETECTION SYSTEM

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STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)
SESSION: 2023-24

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

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CERTIFICATE

I hereby certified that the work which is being presented in the B Tech Major Project report entitled "**Automatic Number Plate Detection** "in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh, INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of Dr. Ruchi Tripathi , Assistant Professor , ECE department .

Signature of Supervisor

Name .....

(Assistant Professor)

Head: **Dr. Soma Das**
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2. INTRODUCTION & MOTIVATION

Introduction:

Automatic Number Plate Detection (ANPD) represents a sophisticated technological framework leveraging advanced pattern recognition algorithms to precisely identify vehicle license plates. In essence, ANPD harnesses the power of video surveillance feeds to seamlessly detect and capture the registration plates of vehicles with exceptional accuracy and efficiency.

We have a system called Automatic Number Plate Detection (ANPD). It's like a smart computer system connected to cameras. These cameras can be in traffic vehicles, mobile units, or CCTV cameras. When a vehicle passes by, these cameras take a picture of its license plate (the number plate). But instead of just storing the picture like a regular camera, the ANPD system gets to work. First, it looks at the picture and finds the edges of the license plate. Think of edges like the outline of the plate; they help the system focus on what's important. Next, it uses something called OCR (Optical Character Recognition). This is like magic for computers - it helps them understand the letters and numbers on the license plate by converting the picture into readable text. Once it knows what's written on the plate, the system looks for rectangles in the image. License plates are usually rectangular, so finding rectangles helps the system locate where the plate is in the picture. By combining these steps - finding edges, reading the text, and locating rectangles - the ANPD system can quickly and accurately identify license plates from digital images. It's like having a super-smart assistant for spotting and recording license plate numbers.

In today's world, owning a vehicle transcends mere luxury; it's now a necessity. However, amidst the convenience, the specter of unforeseen catastrophic events looms. Hence, there's an ever-pressing need to implement robust safety and security measures while also monitoring vehicles to avert potential mishaps. Imagine the benefits: Instant access to vital vehicle information through advanced image processing, enabling agencies to pinpoint vehicle locations swiftly, and automatic alerts for any traffic violations linked to the vehicle. Enter the vehicle tracking system, leveraging the power of GPS technology. This sophisticated system integrates a mechanized device within the vehicle, seamlessly coordinating with software housed in an operational base to precisely monitor its whereabouts. Bolstered by renowned mapping platforms like Google Maps, here, and Bing Maps, this system ensures accurate and real-time representation of vehicle locations, empowering users with

A

Major Project Report

On

STUDY AND DESIGN OF METAMATERIAL ABSORBER USING CYLINDRICAL DIELECTRIC RESONATOR

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

By

Deepesh Kumar Nirala (20106015)

Dhananjay Singh (20106016)

Shabi Shankar (20106072)

B. Tech, VIII Semester

Under the guidance of

DR. NIPUN KUMAR MISHRA

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I hereby certified that the work which is being presented in the B Tech Major Project report entitled "**Study and Design of Metamaterial Absorber using Cylindrical Dielectric Resonator**" in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and Communication Engineering and submitted to the Department of Electronics and Communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of **Dr. Nipun Kumar Mishra** Associate Professor ECE department.

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Chapter 1

INTRODUCTION

1.1 Metamaterial

Metamaterials are human made composite materials assembled in repeating pattern of unit cell. The size of structural unit is smaller than the wavelength (λ) of incident radiation(signal); which, in the last 20 years, have been carefully proposed to exhibit beneficial properties of electromagnetic radiation that are not easily found in nature [1], [2]. Meta Material are materials which contains negative value of permeability and permittivity made up of periodic array structure. Phenomenon of negative index of refraction was first shown by Victor Veselago, a Russian physicist in his research that if a material has both ε and μ simultaneously negative then refractive index (n) will also be negative according to the relation $n = \sqrt{\epsilon \mu}$ [7]. these metamaterial structures are generally made with small thicknesses and compact size. Applications are electromagnetic energy harvesting [3], thermal emitting [4], and sensing [5]. One particularly important application of metamaterials is the creation of perfect absorbers that has ability to absorb incident waves at certain frequencies completely [6]. The radar cross section (RCS) of aircraft used for stealth technology has been reduced through the widespread application of metamaterial-based microwave absorbers. Impedance matching at the interface between the absorber and the free space plays a critical role in achieving the perfect absorption. These characteristics and responses of the metamaterial are entirely dependent on its size and structure. Condition for metamaterial size and periodicity of unit cell-smaller than the wavelength(λ) of the incident wave, Negative refractive index to bend light in unconventional ways, Unique electromagnetic responses such as negative permittivity & permeability, Size of the structural unit cell is less than λ/4. Where (λ) is wavelength of incident radiation.

Fig. 1 Metamaterial Full Structure [17]

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A

Major Project Report

On

Smart UAV-Assisted Real-time Air Pollution Monitoring System for Remote Areas

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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CHAPTER 1

INTRODUCTION

The escalation of environmental pollution poses an urgent challenge to humanity's collective well-being and the sustainability of ecosystems worldwide. Addressing this challenge demands innovative approaches that leverage cutting-edge technologies to efficiently detect, monitor, and mitigate pollution sources. Among these technologies, Unmanned Aerial Vehicles (UAVs), also known as drones, have emerged as versatile tools with the potential to revolutionize environmental monitoring practices.

In recent years, environmental pollution has become a critical global concern, necessitating innovative solutions for timely detection and mitigation. This project proposes the development of a Pollution Detection System employing Unmanned Aerial Vehicles (UAVs) to monitor and assess pollution levels efficiently and effectively. The system aims to utilize the advantages of UAVs, such as mobility, flexibility, and accessibility, to provide real-time data acquisition over large geographical areas.

The proposed system integrates advanced sensors and imaging technologies onboard UAVs to detect various forms of pollution, including air, water, and soil contamination. These sensors are capable of measuring pollutants such as particulate matter, harmful gases, oil spills, and chemical residues with high accuracy and sensitivity. The collected data is transmitted wirelessly to a ground station for analysis and visualization, enabling stakeholders to make informed decisions regarding pollution control and remediation strategies.

Key components of the Pollution Detection System include UAV platforms equipped with environmental sensors, onboard data processing units, communication systems, and a centralized monitoring and control interface. Additionally, machine learning algorithms may be employed to enhance data analysis and enable predictive modelling for pollution trends.

The implementation of the proposed Pollution Detection System offers several advantages, including rapid response to pollution incidents, cost-effectiveness compared to traditional monitoring methods, and reduced risk to human health during data collection in hazardous environments. Furthermore, the system can be customized to meet specific monitoring requirements and integrated with existing environmental monitoring networks for comprehensive pollution management.

Overall, the integration of UAV technology with pollution detection capabilities represents a significant advancement in environmental monitoring, facilitating

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Major Project Report

On

Study & design of Broadband Graphene Metamaterial absorber

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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Taniya Singh (20106060)

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Under the guidance of

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CHAPTER-1

Introduction

METAMATERIALS:

Metamaterials derived from a Greek word "META" which means "beyond" and the Latin word "materia" meaning "matter" i.e., to build such structures which allow a material to show the properties of beyond nature. Metamaterials are structures designed artificially which have properties that can't be observed in conventional materials. These are made by assembling composite materials such as plastic, dielectric materials, and metals in a repeating manner. The properties it does possess will not be the same as their parent materials; rather, they will be-derive from its newly designed structure. They are designed at the nanoscale level to manipulate and control electromagnetic waves, sound waves, and other physical phenomena in other ways which are not possible with naturally available materials. Here the materials interact with Electromagnetic waves based on their structure whereas the conventional interact with EM waves based on the properties of the materials. The chemical composition of the raw material will not provide the unique properties but it is due to its geometry/structure of small physical structures or subwavelength structures known as Meta-atoms/unit-cell.

Conditions for METAMATERIALS:

- Size and periodicity of unit cell-smaller than the wavelength of the incident wave.
- Negative refractive index to bend light in unconventional ways.
- Unique electromagnetic responses such as negative permittivity & permeability.
- Size of the unit cell is of order less than $\lambda/4$. Where λ is the wavelength of the incident electromagnetic wave.

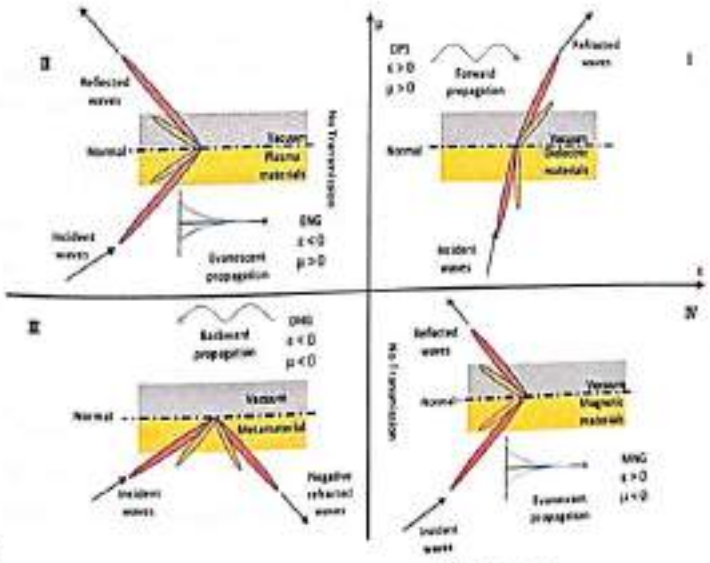

fig-1 permitivity vs permeability graph

Major Project Report

On

DEEP LEARNING BASED FACE EXTRACTION AND ITS ENHANCEMENT FROM SURVEILLANCE VIDEO

Submitted in the partial fulfillment for the award of degree of Bachelor of Technology

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I hereby certify that the work which is being presented in the B.Tech. Major Project report entitled "**Deep Learning Based Face Extraction and its Enhancement From Surveillance Video** " in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of **Mr. Jitendra Bharadwaj (Assistant Professor)** ECE department .

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1 Introduction

Video surveillance systems have become increasingly prevalent in modern society, playing a crucial role in enhancing public safety and security. However, the effectiveness of these systems is often hindered by low-resolution footage or poor visual quality, making it challenging to extract and identify individuals of interest accurately. This limitation was highlighted in a recent incident involving a theft at our residence, where the closed-circuit television (CCTV) footage captured the perpetrator's actions but failed to provide a clear and recognizable depiction of their face.

In response to this problem, our project aimed to develop a comprehensive solution for extracting and enhancing face images from video footage. The primary objective was to leverage state-of-the-art computer vision and deep learning techniques to improve the visual quality and resolution of face bounding boxes, thereby facilitating better identification and recognition.

Specifically, we employed the YOLOv8 pose detection model to localize human keypoints within video frames, enabling the extraction of face bounding boxes based on detected facial landmarks. Subsequently, we explored various upsampling and super-resolution techniques to enhance the resolution and visual clarity of the extracted face images. This involved experimenting with conventional methods such as Upsampling, Conv2D and Conv2DTranspose layers, as well as leveraging the advanced Image Super-Resolution using Enhanced Super-Resolution Generative Adversarial Networks (ESRGAN) pre-trained model.

While the scope of this project was limited to testing on video footage with relatively higher visual quality than the CCTV recording from the theft incident, our work aimed to demonstrate the potential of deep learning-based techniques for improving face recognition capabilities in surveillance applications. The proposed solution contributes to the field of computer vision by offering an automated solution for face extraction and enhancement, potentially addressing the challenges posed by low-resolution or poor-quality video data.

A

Major Project Report

On

An AI-powered system "Docu-Bot" for Intelligent Document Query Assistant (presented with strategies)

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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Under the guidance of

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I hereby certified that the work which is being presented in the B Tech Major Project report entitled "An AI-powered system "Docu-Bot" for Intelligent Document Query Assistant (presented with strategies)"in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgrah INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of Deepak Kumar Rathore Assistant Professor ECE department.

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3. INTRODUCTIONS

In today's digital landscape, the exponential growth of data presents both opportunities and challenges for information retrieval and access. As the volume of digital content continues to expand, users increasingly face difficulties in efficiently locating and extracting relevant information from vast repositories of documents. This trend underscores the pressing need for innovative solutions that can facilitate seamless access to knowledge resources while minimizing the cognitive burden on users. The emergence of conversational AI technologies, such as chatbots, has revolutionized the way individuals interact with information systems. Chatbots, powered by natural language processing (NLP) algorithms and machine learning models, enable users to engage in natural language conversations to perform a wide range of tasks, from retrieving information to completing transactions and accessing services. By leveraging the capabilities of chatbots, organizations can streamline communication channels, improve customer support, and enhance user experiences across various domains. Motivated by the growing demand for efficient information retrieval systems, this project focuses on the development of a chatbot equipped with document search capabilities. The objective is to create an intelligent assistant that can assist users in retrieving information from uploaded PDF documents through conversational interactions. Unlike conventional search engines that rely solely on keyword matching, the proposed chatbot leverages both traditional document search techniques and advanced AI-driven responses to deliver accurate and contextually relevant answers to user queries. By integrating document search functionalities into a conversational interface, the chatbot offers users a more intuitive and efficient way to interact with information repositories, eliminating the need for manual browsing or keyword-based searches. This introduction outlines the scope, objectives, and methodologies of the Docu-Bot system, emphasizing its relevance in today's digital landscape and its potential to transform traditional document management processes.

Background

Traditional document management systems have typically relied on manual sorting, filing, and retrieval processes, which are not only time-consuming but also prone to error. With the advent of digital storage, electronic document management systems (EDMS) came into play, which improved some aspects of document handling but still often required significant manual intervention for data retrieval and lacked advanced capabilities for handling complex queries and analytics. The exponential growth in data volume further complicates this scenario, demanding more robust, intelligent, and automated solutions. The Docu-Bot project emerges as a response to these needs, integrating AI technologies such as natural language processing (NLP), machine learning (ML), and semantic understanding to provide a sophisticated document query system.

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Major Project Report

On

HELMET DETECTION & NUMBER PLATE RECOGNITION USING OPEN CV

Submitted in the partial fulfillment for the award of degree of

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SESSION: 2023-24

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I hereby certified that the work which is being presented in the B Tech Major Project report entitled "**Helmet detection and number plate recognition** "in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering,School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh INDIA is an authentic record of my own work carried out during a period from December 2023 to may 2024(VIII semester) under the supervision of Mrs.Praveena Rajput (Assistant Professor) ECE department .

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CHAPTER-1

1. INTRODUCTION

This project combines computer vision with real-world applications to improve safety and security. It tackles two important tasks:

Helmet detection: This ensures riders comply with helmet laws, reducing head injuries in accidents. Computer vision algorithms automatically check for helmets, aiding enforcement and promoting safety.

License plate recognition: This technology benefits traffic management, law enforcement, and parking control. By using OpenCV to identify license plates in camera footage, the system enables functions like vehicle tracking and security surveillance.

OpenCV, a free computer vision library, is the backbone of this project. It provides tools for image processing, object detection, and character recognition. This allows for real-time analysis of video feeds and images, leading to faster responses.

The project involves several steps: preparing images, detecting objects (using techniques like Haar cascades or deep learning), and extracting license plate numbers with OCR. These elements work together as a unified system that can be adapted to various situations.

Overall, this project using OpenCV represents a significant advancement in applying computer vision for safety and security. By automating helmet detection and license plate recognition, it contributes to safer roads, stronger law enforcement, and a more secure environment

1.1 LITERATURE REVIEW:-

Helmet Detection Techniques:
Researchers are exploring various methods for accurate detecting helmet in images and videos. Deep learning approaches, like convolutional neural networks (CNNs), show promise in achieving this under conditions and different lighting and angles. Studies like "Real-Time Helmet Detection for Motorcycle Riders Using Deep Learning" demonstrate the importance of training deep learning models on large datasets.

Number Plate Recognition (NPR):
NPR technology plays a crucial role in traffic management, law enforcement, and surveillance. Research explores combining OpenCV with Optical Character Recognition (OCR) engines like Tesseract for accurate license plate recognition. This is shown in articles like "License Plate Recognition Using OpenCV and Tesseract OCR Engine". These studies highlight the product of combining image processing and OCR to extract license plate numbers from camera footage.

Reference book: international journal of computer science and mobile computing

A

Major Project Report

On

ANN BASED MPPT ALGORITHM FOR WIND TURBINE USING MATLAB SIMULINK

Submitted in the partial fulfillment for the award of degree of

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)

SESSION: 2023-24

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University)

CERTIFICATE

It is certified that the work which is being presented in the B-Tech Major Project report entitled **"ANN BASED MPPT ALGORITHM FOR WIND TURBINE USING MATLAB SIMULINK"** in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh INDIA is an authentic record of work carried out by **Dasari Tharun kumar, Raikal Tharun & Subhash Kumar** during a period from December 2023 to May 2024 (VIII semester) under the supervision of Mr. Sumit Kumar Gupta (Assistant Professor) & Dr. Soma Das (Professor) ECE department.

Signature of Co-Supervisor

Mr. Sumit Kumar Gupta

(Assistance Professor and Guide)

Signature of Supervisor

Dr. Soma Das

(Professor and Guide)

Head: Dr. Soma Das
Electronics and Communication Engineering Department

विभागाध्यक्ष (इले. एवं संचार अभियांत्रिकी)
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CHAPTER 1: INTRODUCTION

1.1- Introduction

This project wants to make wind turbines work better by using a special computer program called Maximum Power Point Tracking (MPPT). This program helps the turbines to get the most power from the wind by adjusting how they work. Usually, MPPT programs like Perturb and Observe or Incremental Conductance are used, but they might not always work perfectly, especially when the wind is changing a lot. So, this project is trying something new by using a type of computer program inspired by how our brains work, called Artificial Neural Networks (ANNs). These programs can learn and adapt really well, which makes them great for tricky tasks like optimizing wind turbines. By using ANNs, the project hopes to make wind turbines work better in different wind conditions. In simple terms, the project is using smart computer programs to make wind turbines more efficient, which helps us use more clean energy from the wind.

1.2- Objective

The task at hand involves designing and training an Artificial Neural Network (ANN) model to predict the optimal operating point for maximum power extraction from wind turbines. This means utilizing input parameters like wind speed and turbine characteristics to build a robust ANN architecture capable of efficiently tracking power output. The first step is to create an ANN model that can effectively learn and adapt to different wind conditions and turbine configurations. This involves selecting appropriate network architecture, activation functions, and optimization algorithms to ensure accurate prediction of the optimal operating point. Once the ANN model is designed, it needs to be trained using historical data to learn the relationship between input parameters and optimal power output. This training process involves adjusting the network's weights and biases to minimize prediction errors and improve accuracy. After the ANN model is trained and validated, it can be integrated into the control system of a wind turbine model simulated in MATLAB Simulink. This integration allows the ANN-based Maximum Power Point Tracking (MPPT) algorithm to be embedded within the control framework of the turbine. With seamless integration, the ANN-based MPPT algorithm can continuously analyse input parameters such as wind speed and adjust turbine operating parameters in real-time to optimize power generation. This means the wind turbine can dynamically adjust its operating point to extract maximum power from the wind under varying conditions, ultimately improving efficiency and performance.

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A

Major Project Report

On

Pronunciation Improvement App

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

By

HARSH VERMA (20106026)

SRIJANI SOM (20106055)

B. Tech, VIII Semester

Under the guidance of

Mrs Pragati Patharia

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES

IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY)

SESSION: 2023-24

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
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I hereby certified that the work which is being presented in the B Tech Major Project report entitled "Pronunciation Improvement App "in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgrah INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of Mrs Pragati Patharia Assistant Professor ECE department .

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Head: **Dr. Soma Das**
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CHAPTER-1

Introduction

1.1 An Overview of Project Scope

This project aims to develop an innovative solution that leverages advanced speech recognition technology to assist users in refining their pronunciation and spoken English fluency. By harnessing the power of open-source APIs such as Google Cloud Speech-to-Text, the app provides real-time feedback on pronunciation accuracy and identifies areas for improvement.

Furthermore, the app integrates text-to-speech functionality and interactive reading exercises to offer users a comprehensive learning experience. Through a combination of cutting-edge technology and pedagogical strategies, the Pronunciation Improvement App seeks to democratize access to high-quality language education and empower learners to achieve their language learning goals.

With the demand for English proficiency continuing to rise across global industries, this project holds immense potential to make a meaningful impact on the lives of language learners worldwide. Through meticulous research, development, and testing, the Pronunciation Improvement App aims to set a new standard for language learning tools, facilitating greater linguistic fluency and confidence among users.

1.2 Categorization of English Reading and Speaking

In the realm of English language learning and proficiency development, various types of reading and speaking activities play crucial roles in enhancing comprehension, pronunciation, and fluency. Here are some common types:

Types of English Reading:

1. **Silent Reading:** This involves reading text without vocalizing the words. Silent reading is often used for individual practice and comprehension building.

2. **Oral Reading:** In oral reading, individuals read aloud from a text. This practice helps improve pronunciation, intonation, and fluency.

3. **Skimming:** Skimming involves quickly glancing through a text to get a general idea of its content. It is useful for extracting main ideas and identifying key points.

4. **Scanning:** Scanning is the act of quickly searching a text for specific information. It helps readers locate details or answers to specific questions.

5. **Intensive Reading:** Intensive reading involves a close examination of a text for detailed understanding. It focuses on comprehension and analysis of content, often through activities like close reading or annotation.

6. **Extensive Reading:** Extensive reading involves reading longer texts or a large volume of material for enjoyment or general understanding. It helps build vocabulary and improves overall reading fluency.

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Major Project Report

On

"Real Time Alertness Tracking System Based on Yolo Algorithm"

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

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B.Tech. VIII Semester

Under the guidance of

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Assistant Professor

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SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

SESSION: 2023-24

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

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It is certified that the major project entitled **"Real Time Alertness Tracking System Based on YOLO Algorithm"** submitted by **Deependra Kumar, Vikas Jonwal** and **Yash Gupta** in partial fulfillment of the requirements of the award of the degree of Bachelor of Technology in Electronics and Communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, is carried out by them in the Department of Electronics and Communication Engineering during session 2023-24 under supervision and guidance of **Mr. Chandan Tamrakar**, Assistant Professor, Department of Electronics & Communication Engineering, School of Studies in Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur C. G.

Prof. Soma Das
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Chapter 1

Introduction

1.1 Introduction to the Project

In recent years, the landscape of machine learning and computer vision has witnessed a profound shift in technology, particularly in the realm of object detection and tracking. Traditional machine learning algorithms like Support Vector Machines (SVMs) have long been the cornerstone of such tasks, providing reliable solutions for classification problems. However, the emergence of Convolutional Neural Networks (CNNs) has revolutionized the field, offering unprecedented capabilities in real-time object detection, tracking, and recognition.

1.1.1 Utilization of SVM

Historically, Support Vector Machines (SVMs) have served as a go-to choice for various classification tasks, including alertness tracking and drowsiness detection. SVMs are renowned for their ability to separate data points into different classes by maximizing the margin between them in high-dimensional space. In the context of alertness tracking, SVMs have been employed with techniques such as facial landmarking technology to detect subtle changes in facial expressions or features indicative of drowsiness. While SVMs have provided satisfactory results, they often require handcrafted features and may struggle with complex visual patterns or real-time processing demands.

A

Major Project Report

On

"RFID BASED ATTENDANCE MONITORING SYSTEM USING MICROCONTROLLER ESP32"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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B. Tech, VIII Semester

Under the guidance of

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SESSION: 2023-24

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We hereby certified that the work which is being presented in the B Tech Major Project report entitled **"RFID Based Attendance Monitoring System Using Microcontroller ESP32"** in partial fulfillment of the requirements for the award of Bachelor of Technology in Electronics and communication Engineering and submitted to the Department of Electronics and communication Engineering, School of studies in Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh INDIA is an authentic record of my own work carried out during a period from December 2023 to May 2024 (VIII semester) under the supervision of Dr. P.S. Shrivastava, Associate Professor ECE department .

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CHAPTER 1: INTRODUCTION

The conventional attendance monitoring framework has a few impediments with the trend and the technology gap. For instance, passing the everyday attendance sheet to a huge number of students in a class is extremely risky and it hampers the consideration of the students in the class. On the off chance, if the teacher loses these documents, all the significant attendance records are lost without doubt.

Therefore, it is a critical subject to track and manage student's attendance in school, college, and university environment. So, there is a need to manage the student attendance records automatically by using information technology management system in a faculty to assist the maintaining attendance.

In today's tech-driven world, numerous technologies promise automated attendance tracking solutions. However, our focus is on delivering a cost-effective, accessible, and user-friendly alternative. Enter the RFID-based attendance system utilizing the ESP32 microcontroller. Unlike complex and expensive alternatives, our project prioritizes simplicity and affordability without compromising on functionality. By harnessing the power of RFID technology and the versatility of the ESP32, we aim to provide an efficient yet straightforward solution for attendance management. Through this project, we're making attendance tracking accessible to institutions and organizations of all sizes, ensuring that managing attendance is no longer a difficult task.

An RFID-based attendance system utilizing the ESP32 microcontroller presents a modern and efficient solution for tracking attendance in various settings, such as schools, offices, or events. By leveraging RFID technology with the powerful capabilities of the ESP32, this system offers seamless identification and logging of individuals through RFID tags. With the collected data, users can easily monitor attendance records and track attendance trends. Furthermore, integrating the system with a mobile application provides convenient access to attendance information, allowing users to view real-time attendance data and generate reports effortlessly. This combination of hardware and software creates a robust and user-friendly solution for streamlined attendance management.

1.1 RFID Technology:

RFID (Radio Frequency Identification) technology is a sophisticated system that relies on electromagnetic fields to automatically identify and track objects. At its core, RFID involves three primary components: tags, readers, and middleware. Tags are small electronic devices equipped with a chip and

A

Major Project ReportOn

"DISEASE DETECTION USING MACHINE LEARNING"

Submitted in the partial fulfillment for the award of degree of

Bachelor of Technology

In

Electronics and Communication Engineering

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CHAPTER 1

1.1 INTRODUCTION

Disease prediction using patient treatment history and health data by applying data mining and machine learning techniques is ongoing struggle for the past decades. Many works have been applied data mining techniques to pathological data or medical profilesfor prediction of specific diseases. These approaches tried to predict the reoccurrenceof disease. Also, some approaches try to do prediction on control and progression of disease. The recent success of deep learning in disparate areas of machine learning has driven a shift towards machine learning models that can learn rich, hierarchical representations of raw data with little pre-processing and produce more accurate results. With the development of big data technology, more attention has been paid to disease prediction from the perspective of big data analysis; various researches have been conducted by selecting the characteristics automatically from a large number of data to improve the accuracy of risk classification rather than the previously selected characteristics.

The main focus is on to use machine learning in healthcare to supplement patient care for better results. Machine learning has made easier to identify different diseases and diagnosis correctly. Predictive analysis with the help of efficient multiple machine learning algorithms helps to predict the disease more correctly and help treat patients.

With the increase in the number of patients and diseases per annum medical system is overloaded and with time became overpriced in many countries. Most of the disease involves a consultation with doctors to urge treatment. With sufficient data prediction of disease by an algorithm are often very easy and cheap. Prediction of disease by watching the symptoms is an integral part of treatment. In our project, we've tried to accurately predict a disease by watching the symptoms of the patient. The 4 different algorithms for this purpose and gained an accuracy of 92-95%. Such a system can havea really large potential in medical treatment of the longer term. An intelligently interface to encourage interaction with the framework. We've additionally tried tosignify and visualized the results of our study and this project. Currently, a day's doctors square measure adopting

A
Major Project Report
On

SPEECH RECOGNITION DESKTOP ASSISTANT USING PYTHON

Submitted in the partial fulfillment for the award of the degree of
Bachelor of Technology
In
Electronics and Communication Engineering
By

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CHAPTER I

INTRODUCTION

Motivation:

The main goal is to improve the efficiency of the personal assistant application by giving the agent the ability to learn. Because the agent typically performs a large number of repetitive activities, previous experiences can be applied to similar future scenarios. We propose a learn-bydoing agent that will aid the user in completing tasks. The task at hand is to manage the user's desktop or laptop profile. Every user has a daily schedule that requires them to place their desktop or laptop at a distance for a period of time.

Problem Statement:

Users engage with their computers for a variety of purposes in today's fast-paced digital world, from personal organizing and enjoyment to work-related activities. But using a keyboard and mouse the old-fashioned way can be laborious and time-consuming. Our goal is to develop an intelligent desktop assistant that improves user productivity, accessibility, and overall experience in order to address this.

Objective of the Project:

Of course! The creation of an intelligent and effective tool that improves user productivity, accessibility, and overall experience is the main goal of the desktop assistant project. Let's dissect the main goals.

Scope:

Users and their computers can communicate easily thanks to the desktop assistant.
Voice commands and text input are two ways that users can communicate with the system.
It accomplishes tasks, answers questions, and gives pertinent information.

1.1 : PROJECT INTRODUCTION

Our goal in this project is to design and create an intelligent desktop assistant, a multipurpose tool that improves user productivity, makes daily activities easier, and enhances the computing experience in general. Regardless of your role—professional, student, or just someone who uses a computer a lot—this helper will be your trustworthy partner.

A
Thesis
on

"STUDY AND OPTIMIZATION OF TERAHERTZ ABSORBER"

submitted in partial fulfillment of the
Requirements for the degree of

MASTER OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

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(Enrollment No.-GGV/22/01942)
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Under the Guidance of

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Dr. Sudakar Singh Chauhan (Co-Supervisor)
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ABSTRACT

The search for advanced THz absorber has progress in both broadband and multiband absorption technologies. This research produces a novel design for metal-free THz absorber. By using dielectric materials and progressive structural engineering, the proposed absorber establishes high performance across a wide range of THz frequencies without depending on traditional metallic components. The absorber's performance is estimated through theoretical simulations, showing particular improvements in absorption efficiency and bandwidth compared to conventional metal-based absorbers. This development opens new applications in THz sensing, imaging, and communication, whereas metal-free materials offer advantages such as cost effective and reduced complexity.

This thesis focuses on the study and optimization for an innovative technique for achieving broadband and near unity absorption in Metal-Free Absorber (MFA) using graphite and graphene within the THz range. The MFA design consists of graphite/graphene slots and notches at the top that function as resonators, a dielectric SiO_2, substrate in the middle, and a graphite/graphene sheet at the bottom. Graphite/Graphene is chosen for its excellent electrical properties and thermal stability in the THz region, which contribute to the absorber's high performance. And the absorber is also designed to operate effectively over a wide range of incidence angles and also examine the sensing performance of ab absorber which make it a promising solution for a wide range of technological fields, including biomedical use, imaging, energy harvesting, detection, sensing, and solar cells.

The enhancements of devices which operate using electromagnetic waves are really important as we are living in an increasingly interconnected intelligent world. The electromagnetic (EM) spectrum is vast and diverse, with various regions used for numerous of applications. Yet, one region is largely untapped region of the whole spectrum i.e. the Terahertz (THz) region. Between microwaves and visible light this region occupies the spectrum of wavelengths lie between 3 mm to 30 μm devices that operate at microwave or smaller frequencies are termed as electronic materials, and the devices working with visible light or higher frequencies are termed as photonic materials. The THz region, which lies between these two domains, is challenging to develop devices that operate with THz waves and generating THz waves. Instead of these challenges, interest in THz technology has started in the 21st century. Interests in the production of THz waves have increases which lead to increase focus and research in this area. As a result, THz waves progressed lot and aimed to overcome the technical barriers to fully explore the potential of this intriguing part of the electromagnetic spectrum.

1.1 BACKGROUND

The study of electromagnetic absorbers began in the mid of 1930s on wave absorbers for the 2-GHz band at Naamlooze Vennootschap Machinerieen in the Netherlands [1]. During World War II, radar absorbers for military use became an important point of research, mainly through projects like the MIT Radiation Laboratory in the United States [2] and the German Schornsteinfeger Project [3]. In the decades after the war, various electromagnetic (EM) wave absorbers were proposed, metamaterial and metal-free as using carbon-based materials and designed for use in anechoic chambers [4].

With the development of metamaterials in the late 20th century, a significant discovery occurred that is metamaterial absorbers. From the Greek word "meta," The term "metamaterial" comes meaning "beyond," and the Latin word "materia," meaning "matter" or "material," show the idea that these materials have properties not found in nature [5]. Metamaterials gain their unique property from their planned structures rather than their base materials, unlike natural materials. These structures are stereo typically composed of sub-wavelength elements arranged to manipulate electromagnetic waves in innovative ways, such as enhancing, absorbing or blocking them [6]. However, effectively harnessing THz radiation requires specialized materials and devices capable

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A

Thesis

on

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submitted in partial fulfillment of the
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IN

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING,
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY,
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
2023-2024

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING, SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by the Central University Act No. 25 of 2009)

CERTIFICATE

This is certified that the thesis entitled **" ZNS BASED SCHOTTKY DIODE"** submitted by **M. SAI KUMAR** in partial fulfillment of the requirements of the award of the degree of **Master of Technology** in Electronics and Communication Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is accorded to the student's own work, carried out by him in the Department of Electronics and Communication Engineering during the session 2023-2024 under supervision and guidance.

Mrs. PRAGATI PATHARIA
Supervisor
Assistant Professor
Department of Electronics and Communication Engineering, GGV

EXTERNAL EXAMINER

Dr. ANITA KHANNA
Co-Supervisor
Associate Professor
Department of Electronics and Communication Engineering, GGV

Prof. SOMA DAS
Head of Department
Department of Electronics and Communication Engineering, GGV

CHAPTER – 1

INTRODUCTION

Modern electronics require specialized and highly efficient components, which have been developed as a result of the advancement of semiconductor devices. Schottky diodes are one of these devices that are essential in many applications because of their special qualities, which include low forward voltage drop, quick switching, and low power loss. Schottky diodes are especially useful in high-frequency and high-power applications where response speed and efficiency are critical. In this introduction, the Silvaco Technology Computer-Aided build (TCAD) software is used to build and simulate a ZnS-based Schottky diode with a material composition of 60% p-type silicon (p-Si) and 40% n-type zinc sulfide (n-ZnS). Furthermore, it compares the performance of this diode against other Schottky diodes based on pure silicon (Si), zinc telluride (ZnTe), and gallium arsenide (GaAs), demonstrating the superiority of the ZnS-based device.

Figure 1.1 Schottky Diode

The German physicist Walter Schottky is credited with first describing the rectifying behavior seen at the metal-semiconductor junction, hence the name Schottky diodes. Schottky diodes are created when a metal and a semiconductor come into contact, as opposed to traditional p-n junction diodes, which depend on the interaction between p-type and n-type materials. In comparison to silicon p-n junction diodes, which produce a forward voltage drop of 0.7 volts, this metal-semiconductor junction produces a reduced forward voltage drop, usually between 0.2 and 0.3 volts. Higher efficiency results from this reduced voltage drop, particularly in applications that are power-sensitive.

गुरु घासीदास विश्वविद्यालय
(केंद्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 से संसद द्वारा केंद्रीय विश्वविद्यालय)
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Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur – 495009 (C.G.)

A

Thesis

on

INVESTIGATION ON CHANNEL CAPACITY OF OTFS SYSTEM FOR NEXT GENERATION MOBILE NETWORK

submitted in partial fulfillment of the
Requirements for the degree of

MASTER OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

MD ASHIQUE IBRAHIMI

(Enrollment No.-GGV/22/01944)

Roll No.-22031104

Under the Guidance of

DR. PANKAJ SHANKAR SHRIVASTAVA (Supervisor)

Associate Professor, Department of ECE

MR. JITENDRA BHARDWAJ (Co-Supervisor)

Assistant professor, Department of ECE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
2023-2024

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING SCHOOL OF STUDIES OF ENGINEERING & TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central University Established by the Central University Act No. 25 of 2009)

CERTIFICATE

This is certified that the thesis entitled " **INVESTIGATION ON CHANNEL CAPACITY OF OTFS SYSTEM FOR NEXT GENERATION MOBILE NETWORK**" submitted by **MD ASHIQUE IBRAHIMI** in partial fulfillment of the requirements of the award of the degree of **Master of Technology** in Electronics and Communication Engineering, School of Studies of Engineering & Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is accorded to the student's own work, carried out by him in the Department of Electronics and Communication Engineering during the session 2021-2023 under supervision and guidance.

Dr. Pankaj Shankar Shrivastava
Supervisor
Associate professor
Department of Electronics and Communication
Engineering, SoSE&T GGV

External Examiner

Mr. Jitendra Bhardwaj
Co-Supervisor
Assistant professor
Electronics and Communication
Engineering, SoSE&T GGV

Prof. SOMA DAS
Head of Department
Department of Electronics and Communication
Engineering, SoSE&T GGV

ABSTRACT

The system's channel capacity is a key factor in improving the overall performance of wireless communication systems. A very less signal-to-noise ratio (SNR) occurs at the receiving end of wireless communication. Channel capacity depends on bit error rate, distance, SNR, and system bandwidth. Our analysis in this investigation has focused on improving the OTFS system's channel capacity by examining its SNR and spectral efficiency. The average power, noise variation, signal wavelengths, and object distance all affect the OTFS signal-to-noise ratio (SNR). We have tried to analyze these parameters to improve system capacity. The OTFS system's spectral efficiency is dependent on the signal's wavelength, average power, doppler shift, and latency as well as object distance. The SNR and spectral efficiency of the OTFS system for radar applications have been found to rise with the average power and wavelength of the signal.

Keywords- Orthogonal Systems, Signal-to-Noise Ratio (SNR), Time-Frequency Space, Optimization, Distance, Noise Variance, Average Power

Chapter 1:

INTRODUCTION

1.1. Before Emerging of OTFS System.

Before the emergence of the OTFS (Orthogonal Time Frequency Space) system, communication systems primarily relied on modulation techniques like OFDM (Orthogonal Frequency Division Multiplexing) and other traditional methods. OFDM, in particular, gained widespread adoption and became a cornerstone of many wireless and broadband communication standards.

During this time, the focus was on optimizing existing modulation techniques and improving their performance in various communication scenarios. Efforts were made to enhance spectral efficiency, increase data rates, improve robustness to channel impairments such as multipath fading and Doppler shifts, and reduce implementation complexity.

Additionally, researchers and engineers explored alternative modulation schemes, signal processing techniques, and system architectures to address the evolving requirements of modern communication systems. This included the development of multiple antenna systems (MIMO), adaptive modulation and coding techniques, and advanced error correction coding schemes.

However, despite the advancements made with OFDM and other modulation techniques, there were still challenges in highly dynamic environments with fast-moving users, severe multipath fading, and rapidly changing channel conditions. These challenges led to the exploration of new modulation techniques like OTFS, which offers unique advantages in handling time-varying channels and improving system performance in challenging scenarios.

1.2. OFDM (Orthogonal Frequency Division Multiplexing)

Orthogonal frequency division multiplexing (OFDM) has recently been a promising modulation scheme in optical communication systems. It provides a straightforward way to accommodate high data rate links to gain a robust performance. Conventionally, quadrature amplitude modulation (QAM) is commonly adopted in optical OFDM communication systems, because of its high spectrum efficiency (SE) and simple implementation. However, OFDM-QAM suffers a large intercarrier interference (ICI) and spectrum leakage in a practical nonideal

गुरु घासीदास विश्वविद्यालय
(केंद्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केंद्रीय विश्वविद्यालय)
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Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur – 495009 (C.G.)

A

Thesis

on

DESIGN OF FREQUENCY SELECTIVE SURFACE BASED SWITCHABLE ABSORBER / RASORBER

Submitting in partial fulfillment of the Requirements for the degree of

M.Tech
(Electronics and Communication Engineering)

By
NeeharikaVerma
Enrollment No : GGV/22/01945
Roll No. : 22031105

Under The Guidance Of

Dr. Nipun Kumar Mishra (Associate Professor)

Mr. Deepak Rathore (Assistant Professor)

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA BILASPUR 495001
(A CENTRAL UNIVERSITY)
SESSION 2023-2024

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

(A Central university Established by the Central university Act No. 25 of 2009)

CERTIFICATE

This is certified that the thesis entitled **"DESIGN OF FREQUENCY SELECTIVE SURFACE BASED SWITCHABLE ABSORBER / RASORBER"** Submitted by NEEHARIKA VERMA in partial fulfillment of the requirements of the award of the the degree of Master of Technology in Electronics and Communication Engineering, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) is according to the student's own work, carried out by her in the Department of Electronics and Communication Engineering during the session 2023-2024 under supervision and guidance.

Dr.Nipun Kumar Mishra
Supervisor
Department of
Electronics and Communication
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External Examinars

Mr. Deepak Rathore
Co-Supervisor
Department of
Electronics and Communication
Engineering, GGV

Professor Soma Das
Head of the Department
Department of
Electronics and Communication
Engineering, GGV

Abstract

This work presents a novel frequency selective surface (FSS) based switchable absorber / rasorber, enabling dynamic control over electromagnetic wave absorption and reflection. The proposed design leverages a reconfigurable FSS, integrated with a switchable resistive layer, to achieve adaptive absorption and reflection properties. When applying a control voltage, the FSS elements can be toggled between absorptive and reflective states, allowing for real-time manipulation of electromagnetic waves.

The FSS design comprises a periodic array of metallic patches on a dielectric substrate, optimized for resonance at specific frequencies. The switchable resistive layer, comprising PIN diodes or reactors, is integrated with the FSS elements to modulate their impedance. When activated, the resistive layer alters the FSS's electromagnetic properties, switching the structure between absorptive and reflective modes.

Simulation results demonstrate the FSS-based switchable absorber / rasorber's ability to achieve high absorption (>90%) and reflection (>80%) levels at desired frequencies. The design's ability to reconfigure enables the adaptive tuning of the absorption and reflection bands, allowing for applications in advanced electromagnetic systems, such as radar, communication, and sensing.

The proposed switchable absorber / rasorber offers significant advantages over traditional fixed designs, including enhanced flexibility, reduced size, and increased functionality. Potential applications include:

- Adaptive electromagnetic camouflage
- Dynamic radar cross-section control
- Reconfigurable antennas and filters
- Electromagnetic shielding and absorption

This innovative design paves the way for next-generation electromagnetic devices, enabling real-time control over wave propagation and interaction. The FSS-based switchable absorber / rasorber's versatility and reconfigurability make it an attractive solution for various applications, from military to commercial and industrial uses, radome, wireless communication and also reduce the out-of-band signals.

CHAPTER – 1

INTRODUCTION

The modern communication system uses several components that require transmission in one specific band, while out-of-band signals must be minimized. In practical cases, devices have poor rejection performance for out-of-band signals; hence out-of-band signals are also received. Absorption of out-of-band signal can be a good solution to this issue. The device that provide transmission of the desired band and absorption of out-of-band signal is called a rasorber. A rasorber is a combination of absorber and filter. The filter allows the desired signal while the absorber completely absorbs the EM signal. Both absorber and filter can be with metamaterial or frequency selective structures (FSS). Further, the modern era also demands dual functionality structures in stealth and communications; hence, rasorber is a very useful component for stealth and 6G wireless connections.

1.1 Rasorber

The rasorber is the combination of absorber and frequency selective surfaces [1-2]. The capability of rasorbers to combine the frequency selective transmission and resonant absorption [3-5] is accomplished by employing periodic arrays of dielectric [6] or metallic [7] components on a substrate. Rasorber provides a frequency-selective response and resonant absorption at different frequencies. Also, frequency-selective surface filters the EM waves based on frequency. By integrating these technologies, researchers created Rasorbers, which combine the benefits of both worlds.

In the electromagnetic (EM) research, the quest for innovative materials and technologies has led to the development of Rasorbers, an innovative solution for controlling EM waves. Rasorbers, and "radar absorbers" are artificial surfaces engineered to manipulate EM radiation in a new way. This technology has far-reaching implications for various fields, including radar communication systems [8], electromagnetic interference (EMI) mitigation [9], and stealth technology [10].

Rasorbers operate on the principle of resonant absorption and transmission at specific frequencies. It is carefully designed by metallic or dielectric elements and interacts with incident EM waves. This interaction leads to the absorption of specific

INDUSTRIAL TRAINING REPORT

Submited By

ATAULLAH AZIZI

(20106008)

B.Tech. VII Semester

At

SOUTH EAST CENTRAL RAILWAY

From Dated 27.05.2024 to 15.06.2024

Submitted in the partial fulfillment for the award of
the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING, SCHOOL OF STUDIES IN ENGINEERING AND
TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

SESSION: 2024-25

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. ATAULLAH AZIZI**, student of 06th Semester, **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya (Central University) , Koni, Bilaspur (Chhattisgarh)** has attended Bilaspur Division of South East Central Railway for Vocational Training from dated 27.05.24 to 15.06.24 in :-

1.	UTS	5.	IPIS
2.	OFC	6.	IPS
3.	PRS	7.	TELEPHONE EXCHANGE
4.	BATTERY MAINTENANCE	8.	RAILNET

He was found sincere, laborious and interested to the task given to him.

Date : 17-06-2024

Divisional Signal & Telecom Engineer
South East Central Railway, Bilaspur

ABSTRACT PAGE

OBJECTIVE:

To get the vocational training at South East Central Railway, Bilaspur (C.G.), and for gaining experiences about working culture and environment on technical aspects (related to PRS, UTS, RAILNET, etc.) along with overall experience.

METHODOLOGY:

- During the vocational training, the instructor imparted information related to Indian Railways in simple and clear language on training aspects by adopting vocational and exposition approach. The information given by him verbally was written down by all the trainees and saved in their notes.
- During the training, all the trainees were taken to all the important places like office, workshop, store, control panel, and railway platform or junction for demonstration and inspection of important areas and their related equipment.
- After submitting the written report of the information and knowledge gained by the trainee during their training periods, the trainees were provided with internship certificate.

KEY OUTCOMES:

- In this training and internship, the trainee got necessary and essential information about the relevant topics of the Electronics & Communication Engineering branch and the work culture and all the necessary aspects around the communication field.
- We got a detailed understanding about the application, technical knowledge and field work of important points like UTS, PRS, IPIS, IPS, Battery Maintenance, OFC, RailNet, telephone exchange.

INDUSTRIAL TRAINING REPORT

On

" ROBOTICS DESIGN "

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

A M SURYA

(21030101)

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

Certificate of Training

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Ref : IR/06/2024

Date: 07/08/2024

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. A M Surya , final year B.tech – Electronics and Communication Engineering student of SOSET Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, who has undergone Internship Training in our organisation from 17 May 2024 to 5 July 2024.

During his internship, he worked in the Robotics Design, where his creativity, dedication, and innovative approach made a significant impact. His contributions were highly valued, and he demonstrated a commendable level of professionalism and skill throughout his time with us.

We wish him all success in his future endeavours.

Best Wishes,

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Abstract

During the course of my summer internship at IBYD Technologies Pvt Ltd as a robotics design engineer, I contributed to the development of an autonomous mobile robot (AMR) designed for warehouse automation. The project entailed a comprehensive approach, from conceptual design to functional prototyping, aimed at addressing both the technical and operational requirements of warehouse environments. The robot, intended to streamline material handling and sorting, was developed with an emphasis on efficient navigation, adaptability to multi-terrain surfaces, and real-time object detection for robust performance in dynamic environments. The initial phase of my work involved the creation of a Quality Function Deployment (QFD) and comprehensive benchmarking against existing solutions, to ensure that our product met competitive and operational standards. I further developed the component list and Bill of Materials (BOM), which detailed the cost-effective and technically sound components required for the robot's assembly. My work also encompassed the structural design of the robot, where I was responsible for both functional and aesthetic considerations, ensuring that the product's design was optimized for operational efficiency, durability, and user appeal. This process included extensive product sketching and refinement of the Color, Material, and Finish (CMF) to align with modern industrial design trends. To visualize and validate the design, I created a detailed 3D model of the robot using Blender and proceeded to fabricate a 3D-printed prototype using Fusion 360. On the technical side, I worked extensively on the robot's navigation system, simulating the Simultaneous Localization and Mapping (SLAM) algorithm using a 3D LiDAR sensor in MATLAB's Robotics Toolbox. This enabled real-time, autonomous navigation and mapping of warehouse environments. Additionally, I developed an object detection system using an RGB camera and depth sensors, enabling the robot to accurately identify and interact with its surroundings. A key aspect of the robot's functionality was its ability to handle objects autonomously, which required the design of a robotic arm for picking and sorting tasks. I conducted the inverse kinematics calculations necessary for the arm's precise movements, ensuring that it could effectively grasp and manipulate items within the warehouse. Moreover, the robot was designed to be compatible with multi-terrain environments, which led me to simulate its suspension system using Adams software to ensure stability and performance across varied surfaces. In terms of software development, I worked with ROS 2 and Gazebo for the simulation and integration of the robot's systems. These tools were crucial for testing and optimizing the robot's real-time performance in complex environments. My efforts contributed to securing incubation for the product at two prestigious incubation centers in Tamil Nadu. Additionally, the robot was selected to represent our incubation center at an international automation conference, showcasing the product's innovation and potential for real-world application in the logistics sector. This project provided invaluable experience in the interdisciplinary fields of robotics design, mechanical engineering, and automation, while also highlighting the importance of innovation and practical application in real-world.

INDUSTRIALTRAINING REPORT

On

Internship at Indian Railway, Bilaspur

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Achal Kumar

21030102

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

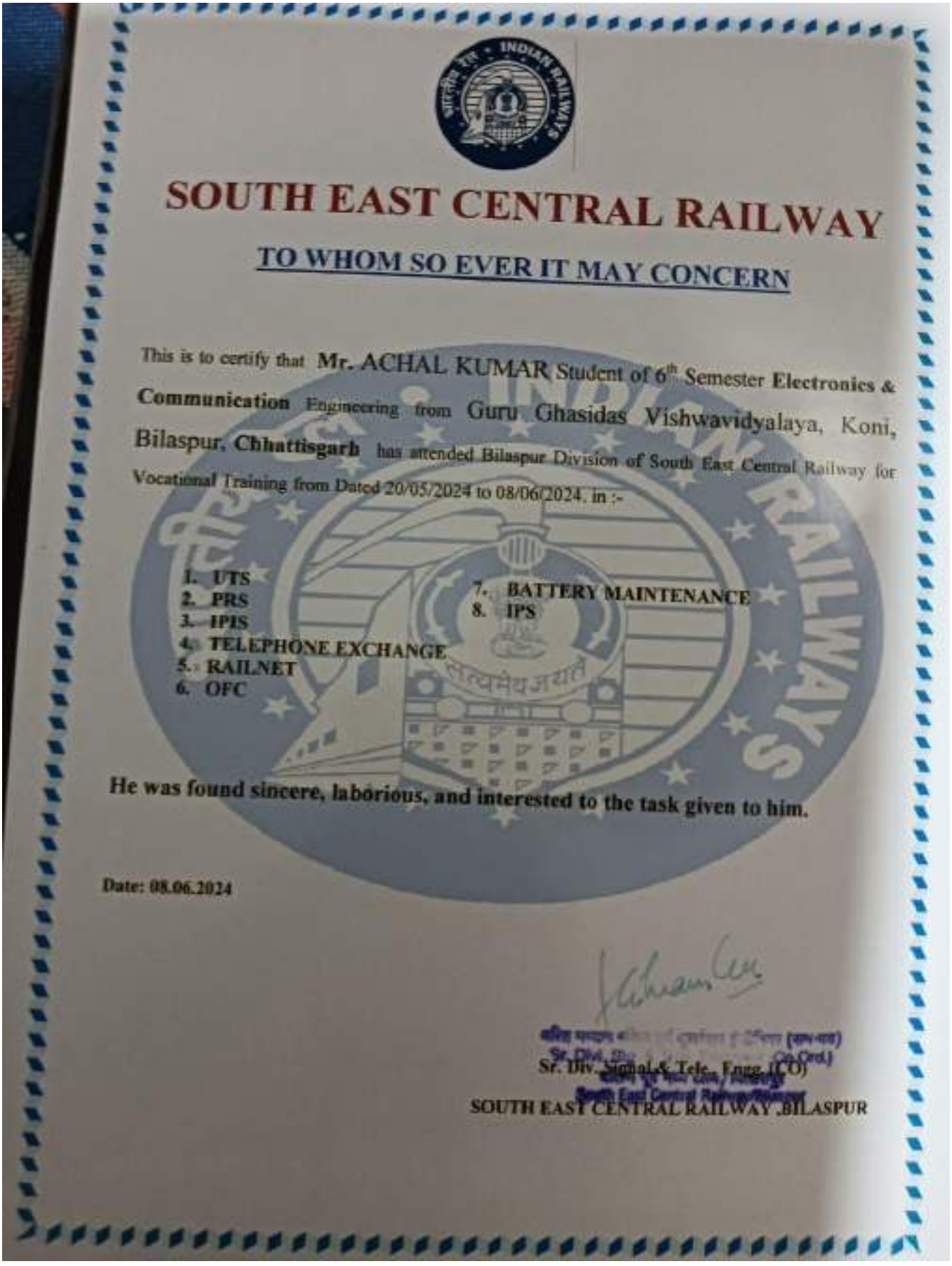
ABSTRACT

This report presents the key experiences and learnings from my industrial training in Indian Railways in the *Electronics and Communication* domain provided a comprehensive understanding of the communication systems and electronic technologies employed in one of the world's largest railway networks. The primary focus was on the role of electronics and communication systems in ensuring efficient and safe railway operations, which included signal processing, communication protocols, and safety mechanisms.

Throughout the internship, I was introduced to various technological aspects, including:
*Railway Signaling Systems: Gained practical knowledge of modern electronic interlocking systems, automatic signaling, and the role of microprocessor-based signaling systems in managing train movements.
*Communication Networks: Hands-on experience with railway communication systems such as VHF (Very High Frequency) and UHF (Ultra High Frequency) wireless networks, GSM-R (Global System for Mobile Communications – Railway), and optical fiber-based communication setups that ensure realtime communication between trains, control rooms, and stationmasters.
*Train Control Systems: Studied the working of centralized traffic control (CTC) and automatic block signaling (ABS), focusing on how electronics and communication systems help improve operational efficiency and safety.
*Safety and Surveillance: Exposure to the role of electronic sensors, track circuits, and CCTV surveillance systems in enhancing railway security and safety. Observed how these technologies detect faults, monitor stations, and ensure passenger safety.
*Power Supply and Control Systems: Learned about the role of uninterrupted power supply (UPS) and control systems for signaling and telecommunication, ensuring reliability and availability of systems.

The internship provided valuable exposure to the integration of electronics, communication, and automation in railway operations, enhancing my understanding of how modern technology plays a crucial role in the functioning of Indian Railways. The hands-on experience and interactions with industry experts significantly deepened my knowledge of practical applications in the electronics and communication field, which will aid in my future career endeavors.

CERTIFICATE



SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. ACHAL KUMAR** Student of 6th Semester **Electronics & Communication** Engineering from Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, **Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 08.06.2024

Sr. Div. Signal & Tele. Engg (CO)
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIAL TRAINING REPORT

On

Vocational Training

(East Central Railway)

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Aditya Raj

21030103

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR(C.G.)

SESSION:2024-25

INTERNSHIP CERTIFICATE

EAST CENTRAL RAILWAY

CERTIFICATE

Ref No. 39/2024

It is certified that *Mr. Aaditya Raj* (Roll No.21030103) 6th Sem., B.Tech. (ECE) of *Guru Ghasidas Vishwavidyalaya , Bilaspur* has been imparted Internship at *S&T Deptt. ECR, Danapur* from 10.06.2024 to 07.07.2024.

The student has undergone training in core activities of Railways like **Digital System (Networking & Maintenance) Telephone Exchange, Optical Fibre Communication System, Working of Railnet, Quad Cable Communication system, Public Announcement System, PRS/UTS working system, Mobile Train Radio Communication, e-office and HRMS, Signal Interlocking System, Basic Signaling System etc.** During this session.

I wish him all success in life.

(Prabhat Kumar)
Asstt. Personnel Officer/MPP
East Central Railway, Hajipur

Place: Hajipur
Date : 08.07.2024

ABSTRACT

During my internship at Indian Railways, I gained hands-on experience in a variety of digital and communication systems essential for railway operations. The primary focus of the internship was on the maintenance and networking of digital systems, including the Telephone Exchange and Optical Fibre Communication System. I worked closely with the Railnet infrastructure, ensuring smooth connectivity and maintaining the Quad Cable Communication System.

Additionally, I gained insights into the Public Announcement System and explored the Passenger Reservation System (PRS) and Unreserved Ticketing System (UTS) operations. I was also introduced to Mobile Train Radio Communication, enhancing communication safety between trains and control centers.

Furthermore, I familiarized myself with the e-office and Human Resource Management System (HRMS), key digital platforms streamlining railway operations. I learned about the Signal Interlocking System and basic signaling systems, which ensure the safe movement of trains. This internship provided me with a comprehensive understanding of modern communication, digital management, and signaling systems, equipping me with practical knowledge of railway infrastructure.

INDUSTRIALTRAINING REPORT

On

Internship at MSME Technology Centre, Durg

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Akash Yadav

21030104

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Embedded Systems, Robotics, and Automation at MSME Durg. The training provided me with the opportunity to gain in-depth knowledge and practical experience in embedded systems, working with a variety of tools and platforms, including Keil, Proteus, Arduino IDE, and TIA Portal.

Throughout the training, I was involved in several hands-on projects such as the development of an Obstacle Avoidance Robot, a Bluetooth-controlled robot, and a Multi-Mode Robot Car, along with systems like the Smart Shopping Cart and Water Level Detection System. These projects involved interfacing hardware components such as LEDs, LCDs, 7-segment displays, and various sensors including Ultrasonic, IR, DHT, and Gas Sensors, along with communication protocols like MQTT, COAP, WebSocket, Zigbee, and Bluetooth.

Additionally, I explored Siemens PLC automation using the TIA Portal software. The experience significantly enhanced my technical skills in embedded systems, automation, and robotics, and allowed me to develop practical, real-world solutions applicable to various industries.

The training has been instrumental in bridging the gap between theoretical knowledge and practical application and it has contributed greatly to my academic and professional development in the field of Electronics and Communication Engineering.

Serial No 150059 Roll No DUST052200300059

MSME TECHNOLOGY CENTRE, DURG

Ministry Of Micro Small & Medium Enterprises,
A Govt. of India Society

Plot - 20, Sector- B, Borai Industrial Growth Centre , Rasmada,Durg (C.G)-491001

This is to certify that

Mr./Miss. AKASH YADAV

has successfully completed the course

EMBEDDED IN ROBOTICS & AUTOMATION

The course comprises the following subjects

1. 8051 MICROCONTROLLER
2. IDE TOOLS USAGE
3. EMBEDDED C
4. INTERFACING MODULES
5. BASIC AUTOMATION
6. ROBOTICS PROJECTS

Period of Course From : 20.05.2024 To : 19.06.2024

Date of Award : 19.06.2024

Course co-ordinator

Training Incharge

INDUSTRIAL TRAINING REPORT

On

VOCATIONAL TRAINING

(Bharat Sanchar Nigam Limited)

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

AMAN BHASKAR

21030105

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERINGS

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURUGHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

CERTIFICATE

This is to certify that the project entitled vocational training submitted to **BHARAT SANCHAR NIGAM LIMITED**, Begusarai(Bihar) for the project in Electronics and Communication engineering is based on our original work carried out under the guidance of JTO(indoor). The report has not been submitted elsewhere for the reward of any degree.

The material borrowed from other sources and used in the report has been duly acknowledged and/or referenced.

I understand that i could be held responsible and accountable for plagiarism, if any is detected later on.

DATE: 12/07/2024

AB

(AMAN BHASKAR)

Signature of candidate

JTO(indoor)

Counter signed by the guide

ABSTRACT

This report outline the comprehensive training program at **Bharat Sanchar Nigam Limited (BSNL)**,where I gained practical exposure to various aspects of telecommunication.The training covered a range of technical subject wireless communication, broadband network, fiber optics, switching technologies and mobile communication system.

One of the core area of focus was how a telephone call is initiated and successfully connected.

During the training ,we gained hand-on-hand experience in the **Main Distributive Function(MDF)** which serves as the central hub for connecting external customer lines to the exchange equipment. At the exchange level,the **Electronic Worldwide Switching Digital(EWSD)** system plays a pivotal role in call processsing.

The visit to the **Power Plant Room** highlighted the critical importance of power management in telecommunication.

In **Switching Room**, we learned how switching system are configured to handle traffic, routing and signaling between exchanges.The training also include the **telecom exchanges** where we studied the physical and functional setup of exchanges.

The **Fiber Optics** formed another key area of focus ,where we study the principle of fiber optics technology and its advantage over copper wiring.

The training also covered **CDMA(Code Division Multiple Access)** and **GSM (Global System for Mobile Communication)**. Currently, our whole Mobile Communication system is based on GSM. It was 31st March 2002 when BSNL started these GSM mobile and today it has provided almost 1.2 billions mobiles all over the country.

This training helped bridge theoretical knowledge with practical ,real-world application in telecommunication.

INDUSTRIAL TRAINING REPORT

On

BASIC TELECOMMUNICATION

From

BSNL for **4 Weeks**

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Anjali Dwivedi (21030106)

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING ,SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

CERTIFICATE

BHARAT SANCHAR NIGAM LIMITED

(A Government Of India Enterprise)

O/o Operational Area Head, Unnao.

CERTIFICATE

No-37

This is to certify that Miss. Anjali Dwivedi student of Deptt.of Electronics & Communication Engg. School of Engineering & Technology Guru Ghasidas Vishwavidyalaya Koni,Bilaspur pursuing B.Tech has successfully completed Summer Training for Four weeks, in Basic Telecom with effect from 27-05-2024 to 22-06-2024 at B.S.N.L. Unnao His performance during the training period was satisfactory.

We wish him all the best for bright future.

Place-Unnao

Date-03-07-2024

O.A . Head
Unnao

ABSTRACT

This report provides an overview of a four-week summer internship at Bharat Sanchar Nigam Limited (BSNL), focusing on basic telecommunications. The primary objective of the internship was to gain practical exposure to telecommunications systems, including network operations, maintenance, and troubleshooting techniques.

The methodology involved hands-on training in various aspects of telecom infrastructure, including the study of transmission systems, signal processing, and equipment operation. Participants engaged in site visits, workshops, and shadowing experienced professionals, facilitating a comprehensive understanding of the telecom environment.

Key outcomes of the training included enhanced technical skills in telecommunications, familiarity with BSNL's operational processes, and insights into industry best practices. The internship not only solidified theoretical knowledge but also fostered critical problem-solving abilities and teamwork skills, preparing interns for future careers in the telecom sector. Overall, this experience underscored the importance of practical training in developing a robust foundation for aspiring telecommunications professionals.

INDUSTRIAL TRAINING REPORT

On

Internship at MSME Technology Centre, Durg

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Anuj Kumar

21030108

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Embedded Systems, Robotics, and Automation at MSME Durg. The training provided me with the opportunity to gain in-depth knowledge and practical experience in embedded systems, working with a variety of tools and platforms, including Keil, Proteus, Arduino IDE, and TIA Portal.

Throughout the training, I was involved in several hands-on projects such as the development of an Obstacle Avoidance Robot, a Bluetooth-controlled robot, and a Multi-Mode Robot Car, along with systems like the Smart Shopping Cart and Water Level Detection System. These projects involved interfacing hardware components such as LEDs, LCDs, 7-segment displays, and various sensors including Ultrasonic, IR, DHT, and Gas Sensors, along with communication protocols like MQTT, COAP, WebSocket, Zigbee, and Bluetooth.

Additionally, I explored Siemens PLC automation using the TIA Portal software. The experience significantly enhanced my technical skills in embedded systems, automation, and robotics, and allowed me to develop practical, real-world solutions applicable to various industries.

The training has been instrumental in bridging the gap between theoretical knowledge and practical application and it has contributed greatly to my academic and professional development in the field of Electronics and Communication Engineering.

Serial No 150061 Roll No DUST052200300061

सत्यमेव जयते

MSME TECHNOLOGY CENTRE, DURG

Ministry Of Micro Small & Medium Enterprises,
A Govt. of India Society

Plot - 2D, Sector- B, Borai Industrial Growth Centre , Rasmada,Durg (C.G)-491001

This is to certify that

Mr./Miss. ANUJ KUMAR

has successfully completed the course

EMBEDDED IN ROBOTICS & AUTOMATION

The course comprises the following subjects

1. 8051 MICROCONTROLLER
2. IDE TOOLS USAGE
3. EMBEDDED C
4. INTERFACING MODULES
5. BASIC AUTOMATION
6. ROBOTICS PROJECTS

Period of Course From : 20.05.2024 To : 19.06.2024

Date of Award : 19.06.2024

Course co-ordinator

Training Incharge

INDUSTRIAL TRAINING REPORT

On

WIRELESS (VERY HIGH FREQUENCY) COMMUNICATION

An internship report submitted in partial fulfillment of requirement for the award of the Degree of Bachelor of Technology

In

ELECTRONICS AND COMMUNICATION ENGINEERING

SUBMITTED BY

ARJU RAJPUT

B.Tech VII Semester

University Registration Number: 21030109

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING GURU GHASIDAS VISHWAVIDYALAYA

BILSPUR, CHHATTISGARH- 495009

राष्ट्रीय इस्पात निगम लिमिटेड
(भारत सरकार का उद्यम)
विशाखपट्टणम इस्पात संयंत्र
विशाखपट्टणम

RASHTRIYA ISPAT NIGAM LIMITED
(A Government of India Enterprise)
Visakhapatnam Steel Plant
Visakhapatnam

ISO 9001:2015, ISO 14001, ISO 50001, ISO 27001 & OHSAS 18001 Certified Company

अधिगम व विकास केंद्र
Learning & Development Centre
प्रमाणपत्र Certificate

यह प्रमाणित किया जाता है कि निम्नलिखित छात्र ने नीचे दिए गए विवरण के अनुसार राष्ट्रीय इस्पात निगम लिमिटेड-विशाखपट्टणम इस्पात संयंत्र में इंटर्नशिप/परियोजना कार्य पूरा किया है।
This is to certify that the following student has undergone Internship /Project Work in Rashtriya Ispat Nigam Limited-Visakhapatnam Steel Plant as detailed below:

छात्र का नाम Name of the Student	: **ARJU RAJPUT**
कोर्स Course	: **BE/B TECH**
विश्वविद्यालय/कालेज का नाम Name of the University / College	: **GURU GHASIDAS VISWA VIDYALAYA,BILASPUR**
परियोजना का शीर्षक Project Title	: **STUDY OF WIRELESS COMMUNICATION SYSTEM**
इंटर्नशिप /परियोजना की अवधि Period of Internship/Project work	: **4 Weeks (from 27-05-2024 to 22-06-2024)**

उपर्युक्त कथित अवधि के दौरान उनका आचरण संतोषजनक पाया गया। During the aforestated period his / her conduct was found to be SATISFACTORY.

100029480
पंजीकरण नं.
Registration No

M Ganesh Babu
AGM (Trg.)

ABSTRACT

This report presents a comprehensive overview of the industrial training undertaken at Rashtriya Ispat Nigam Limited (RINL), Visakhapatnam, focusing on the application of wireless technology in the plant's communication infrastructure. Wireless communication plays a pivotal role in ensuring smooth, real-time operations across various sectors of the steel plant. The report outlines the telecommunication facilities available at RINL and delves into the various communication systems employed, with special attention given to wireless technology, including Very High Frequency (VHF) communication systems.

The training covered both theoretical and practical aspects of telecommunication and wireless systems, exploring how these technologies are integrated within the operational framework of RINL. The significance of reliable wireless communication for plant operations, safety, and productivity was emphasized throughout the training.

Key topics include:

- **Introduction to Visakhapatnam Steel Plant (VSP):** Overview of the plant's operations and the critical need for efficient communication.
- **Telecommunication Facilities at VSP:** A detailed look into the wired and wireless communication infrastructure.
- **Introduction to Communication:** Basics of communication theory relevant to industrial applications.
- **Wireless Communication Systems:** Analysis of wireless systems deployed in RINL, including their design, implementation, and operational efficiency.
- **VHF Communication Systems:** In-depth coverage of VHF systems and their role in maintaining secure and uninterrupted communication across the plant.
- **Test Equipment:** Overview of the tools and test equipment used to ensure optimal performance of communication systems.

The report concludes by highlighting the vital role that wireless technology plays in the efficiency and safety of large-scale industrial operations like RINL, Vizag. Insights gained from this industrial training have significantly deepened the understanding of telecommunication and wireless systems in a real-world industrial environment.

INDUSTRIAL TRAINING REPORT

On

“VOCATIONAL TRAINING”

South East Central Railway

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Ashish Kant

21030111

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Abstract

This internship report presents my experiences and insights gained during my tenure at South East Central Railway, focusing on several key technical areas: Unified Ticketing System (UTS), Passenger Reservation System (PRS), Integrated Passenger Information System (IPIS), telephone exchange operations, RailNet infrastructure, Optical Fiber Communication (OFC), battery maintenance, and Integrated Power Supply (IPS) systems.

The report begins with an overview of each system's functionality and significance in improving operational efficiency and enhancing the passenger experience. I engaged in hands-on training and observation, which allowed me to understand the technical processes involved in maintaining and troubleshooting these systems. For example, I learned how UTS streamlines ticketing, while PRS enhances reservation accuracy and customer service.

Additionally, I explored the workings of the telephone exchange and RailNet, which facilitate communication and data transfer within the railway network. My work with OFC highlighted its role in providing reliable internet connectivity, while the battery maintenance and IPS systems underscored the importance of power reliability in operations.

Throughout my internship, I encountered various challenges, including technical limitations and issues related to system integration. I have included recommendations for improving system reliability and service delivery, which could further enhance operational efficiency.

Ultimately, this internship deepened my understanding of railway operations and underscored the vital role of technology in modernizing railway services, preparing me for a future career in this dynamic field.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. ASHISH KANT**, Student of 6th Semester, School of Studies in Engineering & Technology **(Electronics & Communication)** from **Guru Ghasidas Vishwavidyalaya Bilaspur, Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024, in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 13.06.2024

Sr. Div. Signal & Tele., Engg. (CO)
SOUTH EAST CENTRAL RAILWAY, BILASPUR
South East Central Railway/Bilaspur

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Avinash Jha

21030112

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report adopts a pedagogical approach to demonstrate how theoretical computer science can be applied to provide valuable insights into the behavior of devices that computer systems engineering aims to implement. These insights are achievable using the current state of technology.

The study focuses on solid-state signaling and communication systems, which are now being widely deployed in mainline railway networks. In this field, safety and system reliability are of paramount concern. With this motivation, the report addresses two key issues: the specific challenge of software quality assurance in data-driven control systems, and the broader challenge of ensuring design dependability.

The first issue involves analyzing and verifying safety properties of the geographic data that encode control logic for railway interlocking systems. The second issue explores the reliability and robustness of the communication protocols that support distributed control systems, which are critical for operational integrity.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **AVINASH JHA** Student of 6th Semester **Electronics & Communication** Engineering from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.)** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious and interested to the task given to him.

Date: 08.06.2024

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (स-- ---)
Sr. Divl. Sig. & Tele. Engineer (Co.Ord.)
SR. DIV. Signal & Tele. Engg. (CO)
दक्षिण पूर्व मध्य रेलवे/बिलासपुर
South East Central Railway/Bilaspur
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Baroor Guru Prasad Reddy

21030113

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नम-530012, अ. प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8844/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. BAROOR GURU PRASAD REDDY S/o Shri. BAROOR JAGANNATH REDDY**, studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विशाखपट्टनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.
Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.
Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Bheemisetty Aruna

21030115

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नाम-530012, अ. प्र., भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024

CERT.NO:8859/17.05.2024

Date: 26.06.2024

CERTIFICATE

This is to certify that **Miss. BHEEMISETTY ARUNA D/o Shri. BHEEMISETTY VENKATA RAO, studying B.Tech (ECE)** in **Institute Of Technology, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)** has done **INTERNSHIP in BHEL-HPVP, Visakhapatnam** from **17.05.2024 to 15.06.2024.**

During the above period of training his/her **CONDUCT & PERFORMANCE** were found to be **Very Good.**

26/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबंधक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
भीएचईएल, एचपीवीपी, विशाखापत्तनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.
Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.
Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIAL TRAINING REPORT

On

"PLC ON CNC MACHINE"

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

BODA DHARANI

(21030116)

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24ENG67299 **Date:** 29-06-2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. BODA DHARANI D/o BODA RAMESH with college id no: 21030116 studying in GURU GHASIDAS VISHWA VIDYALAYA, BILASPUR, CHATTISGARH pursuing B.TECH in ELECTRONICS AND COMMUNICATION discipline had undergone project training from 30-05-2024 to 29-06-2024. The title of the project training as per our records is STUDY OF PLC ON CNC MACHINE.

Project training in-charge
BHARATH C SRINIVAS

ABSTRACT

Study of PLC in CNC Machine:

This project focuses on the integration and study of Programmable Logic Controllers (PLC) in CNC (Computer Numerical Control) machines. PLCs are critical components in modern industrial automation, providing precise control and real-time monitoring of machine operations. The goal of this study is to analyze the role of PLCs in enhancing the functionality, efficiency, and flexibility of CNC machines.

The research will explore how PLCs are used to automate the control of various machine components, such as motors, spindles, coolant systems, and tool changers, improving operational speed, safety, and precision. The study will investigate the architecture of PLC systems, their communication with CNC machine controllers, and how they execute real-time instructions for machining tasks.

This project will involve practical experiments, where a CNC machine is integrated with a PLC system. The focus will be on programming the PLC for tasks such as sequence control, interlocking, and handling input/output operations for machining processes. The study will also evaluate the impact of PLCs on machine downtime, cycle times, and overall productivity.

Through data collection and analysis, the project will identify the benefits of using PLCs in CNC machines, such as improved reliability, reduced human intervention, and faster response times. Additionally, the research will explore the scalability and flexibility of PLCs in adapting to complex, customized manufacturing processes.

The outcomes of this study will provide valuable insights for manufacturers and engineers, showing how PLC integration can lead to more intelligent and efficient CNC machine operation. It will also highlight the importance of PLC programming in achieving automation goals in the manufacturing industry, contributing to cost reduction and increased production efficiency.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Dasari Saivardhan Naidu

21030117

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नाम-530012, अ.प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8843/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. DASARI SAI VARDHAN NAIDU S/o Shri. DASARI GUMPASWAMY NAIDU,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)
के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विसाखपट्टणम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTARCT:

Goals:

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to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

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Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Dheeraj Kumar Raj

21030118

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report takes a pedagogical stance in demonstrating how results from theoretical computer science may be applied to yield significant insight into the behavior of the devices computer systems engineering practice seeks to put in place, and that this is immediately attainable with the present state of the art.

The focus for this detailed study is provided by the type of solid state signaling and various communication systems currently being deployed throughout mainline railways. Safety and system reliability concerns dominate in this domain. With such motivation, two issues are tackled: the special problem of software quality assurance in these data-driven control systems, and the broader problem of design dependability. In the former case, the analysis is directed towards proving safety properties of the geographic data which encode the control logic for the railway interlocking; the latter examines the fidelity of the communication protocols upon which the distributed control system depends.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr.DHEERAJ KUMAR RAJ Student of 6th Semester **Electronics & Communication** Engineering from Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, **Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 08.06.2024

Sr. Div. Sig. & Tele. Engineer (Co.Ord.)
South East Central Railway/Bilaspur

SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIAL TRAINING REPORT

On

"PLC ON CNC MACHINE"

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

GUMMALLA BHARGAVI

(21030120)

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24ENGG7297 **Date:** 29/06/2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. GUMMALLA BHARGAVI
D/o GUMMALLA VENKATESWARARAO
with college id no: 21030120 studying in GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHATTISGARH.
pursuing B.TECH in ELECTRONICS AND COMMUNICATION discipline had undergone project training from 30/05/2024 to 29/06/2024. The title of the project training as per our records is
Study OF PLC AND CNC MACHINE.

Project training in-charge

ABSTRACT

Study of PLC in CNC Machine:

This project focuses on the integration and study of Programmable Logic Controllers (PLC) in CNC (Computer Numerical Control) machines. PLCs are critical components in modern industrial automation, providing precise control and real-time monitoring of machine operations. The goal of this study is to analyze the role of PLCs in enhancing the functionality, efficiency, and flexibility of CNC machines.

The research will explore how PLCs are used to automate the control of various machine components, such as motors, spindles, coolant systems, and tool changers, improving operational speed, safety, and precision. The study will investigate the architecture of PLC systems, their communication with CNC machine controllers, and how they execute real-time instructions for machining tasks.

This project will involve practical experiments, where a CNC machine is integrated with a PLC system. The focus will be on programming the PLC for tasks such as sequence control, interlocking, and handling input/output operations for machining processes. The study will also evaluate the impact of PLCs on machine downtime, cycle times, and overall productivity.

Through data collection and analysis, the project will identify the benefits of using PLCs in CNC machines, such as improved reliability, reduced human intervention, and faster response times. Additionally, the research will explore the scalability and flexibility of PLCs in adapting to complex, customized manufacturing processes.

The outcomes of this study will provide valuable insights for manufacturers and engineers, showing how PLC integration can lead to more intelligent and efficient CNC machine operation. It will also highlight the importance of PLC programming in achieving automation goals in the manufacturing industry, contributing to cost reduction and increased production efficiency.

INDUSTRIALTRAINING REPORT

On

“Implementation of Hybrid Full Adder using LT Spice”

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Hitik Kumar Nayak

(21030121)

B.Tech. VII Semester

DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGSCHOOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

In this project, we present the design and simulation of a hybrid full adder utilizing LT Spice, a widely-used electronic circuit simulation tool. The full adder, a fundamental building block in digital electronics, performs the arithmetic sum of three input bits, producing a sum and a carry output. Our design incorporates a hybrid approach, combining both CMOS and transmission gate logic to leverage the advantages of both technologies. CMOS logic provides robustness and low static power consumption, while transmission gate logic offers high-speed operation and reduced transistor count. This hybrid methodology aims to optimize the trade-offs between speed, power consumption, and area, which are critical factors in modern VLSI (Very-Large-Scale Integration) design. In conclusion, this project highlights the potential of hybrid logic designs in enhancing the performance of digital arithmetic circuits. The use of LT Spice for simulation provides valuable insights into the behavior of the full adder, facilitating the design of more efficient and effective computational systems. Future work will focus on scaling the design for integration into larger arithmetic units and exploring further optimizations for specific application requirements. Key words: hybrid full adder, digital design, ltspice

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
National Institute of Technology Raipur
G.E. Road, Raipur–492010 (C.G.)

No./ECE/2024/summer internship/05 Date- 03/07/2024

Internship Completion certificate

This is hereby certified that **Mr. Hitik Kumar Nayak** a student from **GGU, Bilaspur** was engaged as an intern with Department of Electronics and Communication Engineering of NIT Raipur from 17-05-2024 till 30-06-2024. During this period the student worked on ***"Implementation of Hybrid Full Adder using LT Spice"*** under the guidance of **Dr. Chitrakant Sahu, Associate Professor** and completed his delegated responsibilities.

We have found the student diligent and sincere during his internship and wish him all success in his future endeavor.

Dr. Chitrakant Sahu
(Supervisor)

(Dr. Toshanlal Meenpal)
HoD, Dept. of ECE,
NIT Raipur, Chhattisgarh

Department of Electronics & Communication Engineering
National Institute of Technology
Raipur-492 010 (C.G.)

INDUSTRIALTRAINING REPORT

On

REAL TIME CONTROLLERS FOR COMMUNICATION APPLICATIONS

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

JAKKULA RAJESH

Roll No: 21030122

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

DSIR-Common Research & Technology Development Hub (CRTDH)
(Sponsored by DSIR, Ministry of Science & Technology, Govt of India)
NATIONAL INSTITUTE OF TECHNOLOGY (NIT) ANDHRA PRADESH
Room no. 121 & 122, SRK Academic Block, NIT AP Campus, Tadepalligudem - 534101

No. NITANP/CRTDH-ERE/INTERN/04

Date: 05 July 2024

Certification of Appreciation

This is to certify that **Mr. JAKKULA RAJESH,** a student (B.Tech – Electronics & Communication Engineering) of "Guru Ghasidas Vishwavidyalaya, A Central University" has successfully completed the Internship Program on "Real-Time Controllers for Communication Applications" at DSIR- CRTDH, NIT Andhra Pradesh from 01 June 2024 to 30 June 2024 (1 month).

During the internship, he demonstrated good design and programming skills with a self-motivated attitude to learn emerging technologies.

I wish him all the best for his future endeavours.

05/07/2024

Dr. V. Sandeep
Project Manager
DSIR-CRTDH, NIT Andhra Pradesh

Project Manager
DSIR - CRTDH - ERE
National Institute of Technology (NIT)
Andhra Pradesh Tadepalligudem-534101

ABSTRACT:

Goals

Enhance controllers' understanding of real-time communication technologies and related applications.

Boost the troubleshooting and optimization capabilities of controllers for real-time communication networks.

Give controllers the tools they need to successfully execute real-time communication solutions.

Techniques

Theoretical Sessions

Detailed lectures on the fundamentals, protocols, and underlying technologies of real-time communication (e.g., TCP, UDP, RTP).

Practical Workshops: To enhance theoretical understanding, practical activities are conducted using simulation technologies and real-world circumstances.

Case Studies: An examination of actual communication problems and their fixes to offer useful advice.

Question and Answer Sessions: Opportunities for people to express uncertainties and ask questions.

Key Outcomes

Enhanced Technical Understanding The concepts, protocols, and applications of real-time communication were thoroughly understood by the participants.

Enhanced Troubleshooting Skills: Controllers acquired practical methods for identifying and fixing communication problems.

Improved System Optimization: Participants gained the capacity to maximize the performance and dependability of real-time communication systems.

Practical Implementation Skills: In order to create and implement real-time communication solutions, controllers had to acquire these skills.

Possibilities for Networking: The training gave attendees a way to get in touch with colleagues and business leaders.

INDUSTRIAL TRAINING REPORT

On

"PLC ON CNC MACHINE"

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

KASUKURTHI GOPI CHAND

(21030123)

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24ENGG7296 **Date:** 29-06-2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. KASUKURTHI GOPI CHAND S/o shri KASUKURTHI KRISHNA RAO with college id no: 21030123 studying in GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHATTISGARH pursuing B.TECH in ELECTRONICS AND COMMUNICATION discipline had undergone project training from 30-05-2024 to 29-06-2024 .The title of the project training as per our records is STUDY OF PLC ON CNC MACHINE .

Project training in-charge

BHARATH C SRINAYAK
वरिष्ठ उपमहाप्रबंधक / मानव संसाधन विकास केंद्र
Sr. Dy. General Manager / HRDC
भा.ह.वि.लि.-रामचंद्रापुरम, हैदराबाद-32 BHEL-RAMCHANDRAPURAM, HYD-32

ABSTRACT

Study of PLC in CNC Machine:

This project focuses on the integration and study of Programmable Logic Controllers (PLC) in CNC (Computer Numerical Control) machines. PLCs are critical components in modern industrial automation, providing precise control and real-time monitoring of machine operations. The goal of this study is to analyze the role of PLCs in enhancing the functionality, efficiency, and flexibility of CNC machines.

The research will explore how PLCs are used to automate the control of various machine components, such as motors, spindles, coolant systems, and tool changers, improving operational speed, safety, and precision. The study will investigate the architecture of PLC systems, their communication with CNC machine controllers, and how they execute real-time instructions for machining tasks.

This project will involve practical experiments, where a CNC machine is integrated with a PLC system. The focus will be on programming the PLC for tasks such as sequence control, interlocking, and handling input/output operations for machining processes. The study will also evaluate the impact of PLCs on machine downtime, cycle times, and overall productivity.

Through data collection and analysis, the project will identify the benefits of using PLCs in CNC machines, such as improved reliability, reduced human intervention, and faster response times. Additionally, the research will explore the scalability and flexibility of PLCs in adapting to complex, customized manufacturing processes.

The outcomes of this study will provide valuable insights for manufacturers and engineers, showing how PLC integration can lead to more intelligent and efficient CNC machine operation. It will also highlight the importance of PLC programming in achieving automation goals in the manufacturing industry, contributing to cost reduction and increased production efficiency.

INDUSTRIAL TRAINING REPORT

On

“BHEL Manufacture Excellence: Machinery and Products”

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

KOONA MADHURI

(21030124)

VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING,

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY,

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

SESSION: 2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्तनम-530012, आ. प्र., भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024

CERT.NO:8836/16.05.2024

Date: 17.06.2024

CERTIFICATE

This is to certify that **Miss. KOONA MADHURI D/o Shri. KOONA SANYASIRAO, studying B.Tech (ECE)** in **Institute Of Technology, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)** has done **INTERNSHIP in BHEL-HPVP, Visakhapatnam** from **17.05.2024 to 15.06.2024.**

During the above period of training his/her **CONDUCT & PERFORMANCE** were found to be **Very Good.**

17/6/24

(K P Mishra)
Dy. General Manager (HRDC)

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTRACT

In the dynamic realm of modern manufacturing, Computer Numerical Control (CNC) systems stand as technological vanguards, revolutionizing the way we shape, cut, and mold materials. This abstract navigates the transformative impact of utilizing CNC systems, exploring their introduction, generational evolution, programming intricacies, functional dynamics, and the pivotal role of drives.

Witness the evolution of CNC systems across generations, from their humble beginnings to the sophisticated technologies that define the present era. Uncover the technological milestones that have propelled CNC systems to the forefront of precision machining.

Delve into the intricate world of CNC programming, where lines of code translate into the graceful dance of cutting tools. Understand the languages that command CNC machines and the artistry involved in programming paths that bring designs to life.

Unravel the inner workings of CNC systems during operation. From the meticulous movements of cutting tools to the coordination of axes, grasp the functional dynamics that ensure unparalleled accuracy and repeatability in the manufacturing process.

Explore the critical role of drives in driving CNC precision. Understand how motors and drive systems work in harmony to execute intricate movements, ensuring the seamless translation of digital instructions into physical precision on the shop floor.

INDUSTRIALTRAINING REPORT

On

“VOCATIONAL TRAINING”

South East Central Railway

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Kumar Gulshan Raj

Roll No.: 21030125

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This internship report presents my experiences and insights gained during my tenure at South East Central Railway, focusing on several key technical areas: Unified Ticketing System (UTS), Passenger Reservation System (PRS), Integrated Passenger Information System (IPIS), telephone exchange operations, RailNet infrastructure, Optical Fiber Communication (OFC), battery maintenance, and Integrated Power Supply (IPS) systems.

The report begins with an overview of each system's functionality and significance in improving operational efficiency and enhancing the passenger experience. I engaged in hands-on training and observation, which allowed me to understand the technical processes involved in maintaining and troubleshooting these systems. For example, I learned how UTS streamlines ticketing, while PRS enhances reservation accuracy and customer service.

Additionally, I explored the workings of the telephone exchange and RailNet, which facilitate communication and data transfer within the railway network. My work with OFC highlighted its role in providing reliable internet connectivity, while the battery maintenance and IPS systems underscored the importance of power reliability in operations.

Throughout my internship, I encountered various challenges, including technical limitations and issues related to system integration. I have included recommendations for improving system reliability and service delivery, which could further enhance operational efficiency.

Ultimately, this internship deepened my understanding of railway operations and underscored the vital role of technology in modernizing railway services, preparing me for a future career in this dynamic field.

CERTIFICATE

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. KUMAR GULSHAN RAJ,** Student of 6th Semester, School of Studies in Engineering & Technology **(Electronics & Communication)** from **Guru Ghasidas Vishwavidyalaya Bilaspur, Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024, in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious, and interested to the task given to him.

Date: 13.06.2024

Sr. Div. Signal & Tele., Engg. (CO)

SOUTH EAST CENTRAL RAILWAY, BILASPUR

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (समन्वय)
Sr. Divl. Sig. & Tele. Engineer (Co.Ord.)
दक्षिण पूर्व मध्य रेलवे/बिलासपुर
South East Central Railway/Bilaspur

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Kunal Kumar

21030126

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report takes a pedagogical approach to demonstrate how theoretical computer science can provide critical insights into the behavior of devices and systems that are central to modern computer systems engineering. Notably, these insights are accessible with current advancements in the field.

The focal point of this study is the solid-state signaling and communication systems currently deployed across mainline railways. Given the high priority of safety and system reliability in this domain, two key challenges are addressed: software quality assurance in data-driven control systems and the overall dependability of design.

The first challenge focuses on ensuring the safety of the geographic data that encode the control logic for railway interlocking. This involves proving critical safety properties. The second challenge addresses the fidelity and reliability of the communication protocols essential to distributed control systems, which are the backbone of railway operations.

We got a detailed understanding about the application, technical knowledge and field work of important points like UTS, PRS, IPIS, IPS, Battery Maintenance, OFC, RailNet, telephone exchange.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr.** KUNAL KUMAR Student of 6th Semester **Electronics & Communication** Engineering from Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, **Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious, and interested to the task given to him.

Date: 08.06.2024

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (स- ...)
Sr. Divl. Sig. & Tele. Engineer (Co.Ord.)
दक्षिण पूर्व मध्य रेलवे / बिलासपुर
South East Central Railway/Bilaspur

SR. DIV. Signal & Tele. Engg. (CO)
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Lakshmi Kanth Padakandla

21030127

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसाखापत्तनम-530012, आ.प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8841/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. LAKSHMI KANTH PADAKANDLA S/o Shri. SIVA RAMA KRISHNUDU PADAKANDLA,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विशाखपट्टनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.
Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.
Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIAL TRAINING REPORT

Done By

LALIT

(21030128)

B.Tech. VII Semester

At

'SOUTH EAST CENTRAL RAILWAY'

From Dated 20.05.2024 to 08.06.2024

Submitted in the partial fulfillment for the award of
the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

SESSION: 2024-25

CERTIFICATE

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. LALIT**, student of 06th Semester, **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya (Central University) , Koni, Bilaspur (Chhattisgarh)** has attended Bilaspur Division of South East Central Railway for Vocational Training from dated 20.05.24 to 08.06.24 in :-

1.	UTS	5.	IPIS
2.	OFC	6.	IPS
3.	PRS	7.	TELEPHONE EXCHANGE
4.	BATTERY MAINTENANCE	8.	RAILNET

He was found sincere, laborious and interested to the task given to him.

Date : 17.06.2024

17/06/24

Divisional Signal & Telecom Engineer
South East Central Railway, Bilaspur

Div. Sig. & Tele. Engineer
दक्षिण पूर्व मध्य रेलवे/Bilaspur
South East Central Railway/Division

ABSTRACT

OBJECTIVE:

To get the vocational training at South East Central Railway, Bilaspur (C.G.), and for gaining experiences about working culture and environment on technical aspects (related to PRS, UTS, RAILNET, etc.) along with overall experience.

METHODOLOGY:

- During the vocational training, the instructor imparted information related to Indian Railways in simple and clear language on training aspects by adopting vocational and exposition approach. The information given by him verbally was written down by all the trainees and saved in their notes.
- During the training, all the trainees were taken to all the important places like office, workshop, store, control panel, and railway platform or junction for demonstration and inspection of important areas and their related equipment.
- After submitting the written report of the information and knowledge gained by the trainee during their training periods, the trainees were provided with internship certificate.

KEY OUTCOMES:

- In this training and internship, the trainee got necessary and essential information about the relevant topics of the Electronics & Communication Engineering branch and the work culture and all the necessary aspects around the communication field.
- We got a detailed understanding about the application, technical knowledge and field work of important points like UTS, PRS, IPIS, IPS, Battery Maintenance, OFC, RailNet, telephone exchange.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Madabathula Pranav Sai

21030129

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नाम-530012, अ.प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8838/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. MADABATHULA PRANAV SAI S/o Shri. MADABATHULA V V S S RAO,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
भीएचईएल, एचपीवीपी, विशाखापत्तनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.
Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.
Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIAL TRAINING REPORT

On

“Phase Transition Driven and
Angle Multiplexed
Broad/Narrowband THz
Absorber”

Submitted in the partial fulfillment for the award
of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

by

Maitri Mahak
(21030130)
B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)
SESSION:2024-25

राष्ट्रीय प्रौद्योगिकी संस्थान, पटना
NATIONAL INSTITUTE OF TECHNOLOGY, PATNA
(An Institute under Ministry of Education, Govt. of India)
ASHOK RAJPATH, PATNA - 800005, BIHAR

Date: 28/06/2024

TO WHOM IT MAY CONCERN

This is to certify that **Ms. Maitri Mahak**, Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, 495009, has finished summer internship of six weeks from **17th May 2024 to 28th June 2024** under the supervision of **Dr. Gaurav Varshney** at ECE Department, **National Institute of Technology Patna**, India.

She has done a significant work on the topic "**Phase Transition Driven and Angle Multiplexed Broad/Narrowband THz Absorber**" during summer internship.

28/06/2024

Dr. Gaurav Varshney
Assistant Professor,
ECE Department, NIT Patna, India

ABSTRACT

I Maitri Mahak, did my summer internship at National Institute of Technology, Patna (NIT-P) under the supervision of Dr. Gaurav Varshney. My domain of work was electromagnetism where I learnt to work on CST Studio Suite software for designing and simulation of EM Absorber in Terahertz (THz) spectrum. An absorber was designed which gave both broadband and narrowband absorption spectrum upon varying conductivity of the VO2 resonator and studied the thermally switchable response between the broad and narrowband spectrum. The absorber design was evolved in such a way that is can remain polarization insensitive. The Brewster Effect was also studied in the insulating phase and it was concluded that it generates multiple absorption peaks in the insulating phase.

In the course of my internship, I along with my supervisor published a paper for the journal IEEE Transaction of Plasma Science (IEEE-TPS).

INDUSTRIAL TRAINING REPORT

On

“STUDY OF PLC ON CNC MACHINE”

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

MALLA AMULYA PRIYA

GGV/21/01231

B. Tech, VII Semester

DEPARTMENT OF ELECTRONICS AND

COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND

TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(C.G.) SESSION: 2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24EN667298 **Date:** 29/6/2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. MALLA AMULYA PRIYA
D/O MALLA BABU RAO
with college id no: 21030131 studying in GURU GHASIDAS
VISHWAVIDHYALAYA, KONI, BILASPUR, CHATTISGARH
pursuing B-TECH in Electronics & Communication Engineering
discipline had undergone project training from 30/5/2024 to
29/6/2024. The title of the project training as per our records is
STUDY OF PLC ON CNC MACHINE.

Project training in-charge

BHARATH C SRINAYAK
Dy. General Manager / HRDC

ABSTRACT

This project report investigates the critical role of Programmable Logic Controllers (PLC) in enhancing the automation, precision, and efficiency of Computer Numerical Control (CNC) machines, which are essential in modern industrial manufacturing. CNC machines are widely used for machining operations such as milling, drilling, and turning, and the integration of PLC systems has significantly improved their performance and flexibility.

The report delves into the architecture and working principles of both CNC and PLC systems, exploring how PLCs are employed to automate complex machine functions such as axis movements, tool positioning, spindle control, and safety interlocks. The flexibility of PLCs allows for the customization of CNC machine operations through ladder logic programming, making the system adaptable to different manufacturing needs. This results in improved operational accuracy, optimized cycle times, and enhanced safety protocols.

In this study, we analyze the communication interface between PLCs and CNC controllers, focusing on how PLCs enable real-time monitoring and control of machine processes. Case studies of industrial applications demonstrate the tangible benefits of PLCs in CNC machines, including increased throughput, minimized machine downtime, and easier system upgrades.

In conclusion, the study highlights that the integration of PLCs in CNC machines is indispensable for achieving high-performance manufacturing, and recommends adopting advanced PLC programming techniques to fully leverage the capabilities of modern CNC systems in the evolving industrial landscape.

INDUSTRIALTRAINING REPORT

On

“Evaluation of Industrial Training at South East Central Railway”

Submitted in the partial fulfillment for the award of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

MOKSHLATA

21030132

B.Tech. VII Semester

DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGS

CHOOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Certificate Of Training

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Ms. **MOKSHLATA** Student of 6th Semester **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur , Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

She was found sincere, laborious and interested to the task given to her.

Date: 08.06.2024

Div. Signal & Tele. Engg.

SOUTH EAST CENTRAL RAILWAY ,BILASPUR

ABSTRACT

This report presents an evaluation of industrial training at South East Central Railway, Bilaspur (C.G.), aimed at gaining technical knowledge on systems such as the Passenger Reservation System (PRS), Unreserved Ticketing System (UTS), and RailNet. The training, delivered in a straightforward manner, allowed trainees to document the information while visiting key locations such as workshops, control panels, and railway platforms for hands-on experience. Upon submitting reports, trainees received internship certificates. The key outcomes of the training included practical insights into systems like UTS, PRS, Integrated Passenger Information System (IPIS), battery maintenance, optical fiber communication (OFC), and telephone exchanges. This experience provided valuable knowledge and skills in communication technology, laying a strong foundation for future work in electronics and communication engineering.

INDUSTRIALTRAINING REPORT

On

WORK OF PLC ON CNC MACHINE

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

N PRATHUSHA

21030133

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24ENGG7895 **Date:** 29/06/2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. N. PRATHUSHA
D/O N. SOMASEKHAR
with college id no: 21030133 studying in GURU GHASIDAS VISHWAVIDYALAYA, KONI, BILASPUR, CHATTISGARH
pursuing B-TECH in ELECTRONICS & COMMUNICATION ENGG discipline had undergone project training from 30/5/2024 to 29/06/2024. The title of the project training as per our records is STUDY OF PLC ON CNC MACHINE.

Project training in-charge

BHARATH C SRINAYAK

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees .Work and role of PLC in CNC machine.

Industrialazation has triggered advances in technology all over the world and has placed the need for machine tools to be controlled to very high levels of accuracy.

The basic advantage of this over conventional machines is the flexibility being offered by the CNC system.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles. In addition ,tool magazines and automatic tool changers.

Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines. Work of PLC system and wiring of CNC machines.

Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.

Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed. To perform logical decision of PLC making for industrial control applications.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.

Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.

Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.

Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.

All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

Participants gained knowledge on PLC role on machine.

Participants gained knowledge on how machines and coding are related.

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Nabed Ahmad

21030134

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report takes a pedagogical stance in demonstrating how results from theoretical computer science may be applied to yield significant insight into the behavior of the devices computer systems engineering practice seeks to put in place, and that this is immediately attainable with the present state of the art.

The focus for this detailed study is provided by the type of solid state signaling and various communication systems currently being deployed throughout mainline railways. Safety and system reliability concerns dominate in this domain. With such motivation, two issues are tackled: the special problem of software quality assurance in these data-driven control systems, and the broader problem of design dependability. In the former case, the analysis is directed towards proving safety properties of the geographic data which encode the control logic for the railway interlocking; the latter examines the fidelity of the communication protocols upon which the distributed control system depends.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **NABED AHMAD** Student of 6th Semester **Electronics & Communication** Engineering from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.)** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious and interested to the task given to him.

Date: 08.06.2024

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (सह- ~~)
Sr. Divl. Sig. & Tele. Engineer (Co.Ord.)
दक्षिण पूर्व मध्य रेलवे / बिलासपुर
South East Central Railway/Bilaspur

SR. DIV. Signal & Tele. Engg. (CO)
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIAL TRAINING REPORT

On

"MACHINE LEARNING FOR MUSIC GENRE CLASSIFICATION OF SVM AND KNN ALGORITHMS"

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

NAKKINA SAILAKSHMI

(21030135>)

B.Tech.VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY GURUGHASIDASVISHWA VIDYALAYA,BILASPUR(C.G.)

SESSION: 2024-25

CHIP ELECTRONICS TRAINING INSTITUTE

(Design Your Career)

Door No: 33-21-4, First Floor, Seetharampuram Signals
Elur Road, Vijayawada-520002.

CERTIFICATE OF COMPLETION

This is to certify that

NAKKINA SAILAKSHMI

From

GURU GHASIDAS VISWAVIDYALAYA
BILASPUR

has Successfully completed the 6 Weeks internship program on "AI & ML DEVELOPER (MACHINE LEARNING)". The duration of the internship from 22nd May to 1st July 2024. During this internship period student performance was excellent.

ID NUMBER: CETIEC231079

For Chip Electronics Training Institute

RURao

Authorized Signatory

Managing Director

CHIP ELECTRONICS TRAINING INSTITUTE KUKATPALLY

CHIP ELECTRONICS TRAINING INSTITUTE
(Design Your Career)
Door No: 33-21-4, First Floor, Seetharampuram Signals
Elur Road, Vijayawada-520002.

ATTENDANCE REPORT

Name of the College	GURU GHASIDAS VISWAVIDYALAYA BILASPUR
Name of the Student	NAKKINA SAILAKSHMI
Roll Number	21030135
Internship Program	AI & ML DEVELOPER (MACHINE LEARNING)
Attendance Percentage	95%

WEEK WISE ATTENDANCE REPORT

MONTH	1 WEEK		2 WEEK		3 WEEK		4 WEEK	
	FN	AN	FN	AN	FN	AN	FN	AN
1 MONTH	21	21	22	21	22	21	21	21
2 MONTH	21	21	22	22				

For Chip Electronics Training Institute

Authorized Signatory

Managing Director

ABSTRACT

A succinct overview of the goals, procedures, findings, and recommendations.

Emphasize the study's importance and possible effects on content-based music retrieval using recommended instruments or music recommendation systems.

Keywords Supervised Learning, KNN, SVM, Machine Learning, Model accuracy, Classification Analysis

The rapid development of digital music technologies has revolutionized the production, sharing, and consumption of music. The demand for efficient techniques to arrange and classify music has increased due to the rapid expansion of online music libraries and streaming services. Music genre classification is an essential component of recommendation systems, facilitating effective music retrieval, and increasing user experience. It entails grouping music songs into preset genres.

Music classification has historically been dependent on human judgment and labor-intensive, subjective manual tagging. Machine learning, on the other hand, has completely changed this industry by providing automated methods that can evaluate big datasets more quickly and accurately. Support Vector Machine (SVM) and k-Nearest Neighbors (KNN) are two of the machine learning techniques that are currently in use.

A . Music genre Classification

A previous study provided an approach to achieve musical genre categorization by using a support vector machine (SVM) to create the best possible classifier. Mel-frequency cepstral coefficients (MFCC) are widely employed as support vector machines (SVM) feature vectors for music genre classification.

While melody is one of the most important indicators for understanding music data properties, melody is not always a good fit to be used as a feature vector for categorizing different genres of music. It also helps to think about the instruments that are typically connected to each genre in order to improve the classification of genres. As an illustration:

Rock: drums, bass guitar, and electric guitar

Pop: Electric guitar, keyboard, synthesizer

Jazz: piano, double bass, trumpet, and saxophone

Classical: Piano, cello, violin, and orchestral parts

Country: fiddle, banjo, and acoustic guitar.

Provides more background information so that the musical traits connected to each genre can be understood in more detail.

This method of capturing the distinctive timbres and textures that characterize different musical styles may result in enhanced categorization accuracy.

B.Musical Synopsis

Because it lowers the computational burden of evaluating huge audio files, music summarizing is essential for effective genre classification.

In order to compute feature vectors like Mel-frequency cepstral coefficients (MFCCs), it entails extracting representative segments from music data.

Using a clustering technique, comparable frames are grouped together, and the longest segment is summarized by the label that appears most frequently. This method usually finds recurring elements, such popular music guitar riffs, which are often excerpts from previous sections of a song. By adding typical instruments from each genresuch as saxophones in jazz or electric guitars in rockalgorithms like SVM and KNN can be more accurately classified, offering insightful information about the unique qualities of different musical genres.

INDUSTRIAL TRAINING REPORT

On

Internship at MSME Technology Centre, Durg

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

NISHANT GAURAV

21030136

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Embedded Systems, Robotics, and Automation at MSME Durg. The training provided me with the opportunity to gain in-depth knowledge and practical experience in embedded systems, working with a variety of tools and platforms, including Keil, Proteus, Arduino IDE, and TIA Portal.

Throughout the training, I was involved in several hands-on projects such as the development of an Obstacle Avoidance Robot, a Bluetooth-controlled robot, and a Multi-Mode Robot Car, along with systems like the Smart Shopping Cart and Water Level Detection System. These projects involved interfacing hardware components such as LEDs, LCDs, 7-segment displays, and various sensors including Ultrasonic, IR, DHT, and Gas Sensors, along with communication protocols like MQTT, COAP, WebSocket, Zigbee, and Bluetooth.

Additionally, I explored Siemens PLC automation using the TIA Portal software. The experience significantly enhanced my technical skills in embedded systems, automation, and robotics, and allowed me to develop practical, real-world solutions applicable to various industries.

The training has been instrumental in bridging the gap between theoretical knowledge and practical application and it has contributed greatly to my academic and professional development in the field of Electronics and Communication Engineering.

Serial No 150058 Roll No DUST152405000058

MSME TECHNOLOGY CENTRE, DURG

Ministry Of Micro Small & Medium Enterprises,
A Govt. of India Society

Plot - 2D, Sector- B, Borai Industrial Growth Centre , Rasmada,Durg (C.G)-491001

This is to certify that

Mr./Miss. NISHANT GAURAV

has successfully completed the course

EMBEDDED IN ROBOTICS & AUTOMATION

The course comprises the following subjects

1. 8051 MICROCONTROLLER
2. IDE TOOLS USAGE
3. EMBEDDED C
4. INTERFACING MODULES
5. BASIC AUTOMATION
6. ROBOTICS PROJECTS

Period of Course From : 15.05.2024 To : 14.06.2024

Date of Award : 14.06.2024

Course co-ordinator

Training Incharge

INDUSTRIALTRAINING REPORT

On

“Evaluation of Industrial Training at South East Central Railway”

Submitted in the partial fulfillment for the award of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

OM PRAKASH KUMAR

21030137

B.Tech. VII Semester

DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGS

CHOOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Certificate Of Training

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **OM PRAKASH KUMAR** Student of 6th Semester **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur, Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPES
4. TELEPHONE EXCHANGE
5. RAILNET
6. GSC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 08.06.2024

Sr. Dy. Signal & Telecom (CO)
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

ABSTRACT

This report presents an evaluation of industrial training at South East Central Railway, Bilaspur (C.G.), aimed at gaining technical knowledge on systems such as the Passenger Reservation System (PRS), Unreserved Ticketing System (UTS), and RailNet. The training, delivered in a straightforward manner, allowed trainees to document the information while visiting key locations such as workshops, control panels, and railway platforms for hands-on experience. Upon submitting reports, trainees received internship certificates. The key outcomes of the training included practical insights into systems like UTS, PRS, Integrated Passenger Information System (IPIS), battery maintenance, optical fiber communication (OFC), and telephone exchanges. This experience provided valuable knowledge and skills in communication technology, laying a strong foundation for future work in electronics and communication engineering.

INDUSTRIAL TRAINING REPORT

On

Industrial Training

On

Telecommunication Line

(S.A.I.L)

Submitted in the partial fulfillment for the award of
the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

PRAKASH KUMAR

21030139

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This industrial training report provides an overview of the experiences and learning outcomes gained during a practical training program at a steel manufacturing plant. The training aimed to familiarize participants with the operational processes, safety protocols, and quality control measures integral to steel production. Key areas of focus included the various stages of production, such as raw material handling, smelting, refining, and casting, as well as the application of modern technologies in enhancing efficiency and sustainability.

Through hands-on experience and observations, insights were gained into the challenges faced by the industry, including environmental considerations and energy consumption. The report highlights the importance of adhering to safety regulations to ensure a secure working environment. Furthermore, it discusses the significance of teamwork and effective communication in maintaining operational excellence. Overall, this training provided a comprehensive understanding of the steel production process and the critical role it plays in the global economy.

[redacted]

[redacted]

INDUSTRIALTRAINING REPORT

On

“VOCATIONAL TRAINING”

South East Central Railway

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Pranav Kumar

21030140

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Abstract

This internship report presents my experiences and insights gained during my tenure at South East Central Railway, focusing on several key technical areas: Unified Ticketing System (UTS), Passenger Reservation System (PRS), Integrated Passenger Information System (IPIS), telephone exchange operations, RailNet infrastructure, Optical Fiber Communication (OFC), battery maintenance, and Integrated Power Supply (IPS) systems.

The report begins with an overview of each system's functionality and significance in improving operational efficiency and enhancing the passenger experience. I engaged in hands-on training and observation, which allowed me to understand the technical processes involved in maintaining and troubleshooting these systems. For example, I learned how UTS streamlines ticketing, while PRS enhances reservation accuracy and customer service.

Additionally, I explored the workings of the telephone exchange and RailNet, which facilitate communication and data transfer within the railway network. My work with OFC highlighted its role in providing reliable internet connectivity, while the battery maintenance and IPS systems underscored the importance of power reliability in operations.

Throughout my internship, I encountered various challenges, including technical limitations and issues related to system integration. I have included recommendations for improving system reliability and service delivery, which could further enhance operational efficiency.

Ultimately, this internship deepened my understanding of railway operations and underscored the vital role of technology in modernizing railway services, preparing me for a future career in this dynamic field.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. PRANAV KUMAR**, Student of 6th Semester, School of Studies in Engineering & Technology **(Electronics & Communication)** from **Guru Ghasidas Vishwavidyalaya Bilaspur, Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024, in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 13.06.2024

Sr. Div. Signal & Tele. Engg.(TCO)
SOUTH EAST CENTRAL RAILWAY, BILASPUR

INDUSTRIALTRAINING REPORT

On

“VOCATIONAL TRAINING”

South East Central

Railway

Submitted in the partial fulfillment for the

award of the Degree of Bachelor of

Technology

In

Electronics and Communication Engineering

By

Pranshu Chandra

Roll No.: 21030141

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES OF ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This internship report presents my experiences and insights gained during my tenure at South East Central Railway, focusing on several key technical areas: Unified Ticketing System (UTS), Passenger Reservation System (PRS), Integrated Passenger Information System (IPIS), telephone exchange operations, RailNet infrastructure, Optical Fiber Communication (OFC), battery maintenance, and Integrated Power Supply (IPS) systems.

The report begins with an overview of each system's functionality and significance in improving operational efficiency and enhancing the passenger experience. I engaged in hands-on training and observation, which allowed me to understand the technical processes involved in maintaining and troubleshooting these systems. For example, I learned how UTS streamlines ticketing, while PRS enhances reservation accuracy and customer service.

Additionally, I explored the workings of the telephone exchange and RailNet, which facilitate communication and data transfer within the railway network. My work with OFC highlighted its role in providing reliable internet connectivity, while the battery maintenance and IPS systems underscored the importance of power reliability in operations.

Throughout my internship, I encountered various challenges, including technical limitations and issues related to system integration. I have included recommendations for improving system reliability and service delivery, which could further enhance operational efficiency.

Ultimately, this internship deepened my understanding of railway operations and underscored the vital role of technology in modernizing railway services, preparing me for a future career in this dynamic field.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. PRANSHU CHANDRA** , Student of 6th Semester, School of Studies in **(Electronics & Communication) Engineering** from **Guru Ghansidas Vishwavidyalaya,Koni,Bilaspur** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/07/2024 to 08/06/2024, in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious, and interested to the task given to him.

Date: 09.06.2024

08/06/24

Divisional Signal & Telecom Engg.
मण्डल संकेत एवं दूरसंचार इंजीनियर
SOUTH EAST CENTRAL RAILWAY, BILASPUR
दक्षिण पूर्व मध्य रेलवे / बिलासपुर
South East Central Railway/Bilaspur

INDUSTRIALTRAINING REPORT

On

“Evaluation of Industrial Training at South East Central Railway”

Submitted in the partial fulfillment for the award of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

PREETY KUMARI

21030142

B.Tech. VII Semester

DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGS

CHOOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Certificate Of Training

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Ms. **PREETY KUMARI** Student of 8th Semester **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur , Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024 in :-

1. UTS
2. PRS
3. IPDS
4. TELEPHONE EXCHANGE
5. RAILNET
6. [illegible]
7. BATTERY MAINTENANCE
8. IPS

She was found sincere, laborious and interested to the task given to her.

Date: 08.06.2024

Dy. [illegible]

SOUTH EAST CENTRAL RAILWAY, BILASPUR

ABSTRACT

This report presents an evaluation of industrial training at South East Central Railway, Bilaspur (C.G.), aimed at gaining technical knowledge on systems such as the Passenger Reservation System (PRS), Unreserved Ticketing System (UTS), and RailNet. The training, delivered in a straightforward manner, allowed trainees to document the information while visiting key locations such as workshops, control panels, and railway platforms for hands-on experience. Upon submitting reports, trainees received internship certificates. The key outcomes of the training included practical insights into systems like UTS, PRS, Integrated Passenger Information System (IPIS), battery maintenance, optical fiber communication (OFC), and telephone exchanges. This experience provided valuable knowledge and skills in communication technology, laying a strong foundation for future work in electronics and communication engineering.

INDUSTRIAL TRAINING REPORT

Submitted By

PRITESH KUMAR

(20130143)

B.Tech. VII Semester

At

SOUTH EAST CENTRAL RAILWAY
BILASPUR

From Dated 20.05.2024 to 08.06.2024

Submitted in the partial fulfillment for the award of
the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING, SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)

SESSION: 2024-25

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. PRITESH KUMAR**, student of 06th Semester, **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya (Central University) , Koni, Bilaspur (Chhattisgarh)** has attended Bilaspur Division of South East Central Railway for Vocational Training from dated 20.05.24 to 08.06.24 in :-

1.	UTS	5.	IPIS
2.	OFC	6.	IPS
3.	PRS	7.	TELEPHONE EXCHANGE
4.	BATTERY MAINTENANCE	8.	RAILNET

He was found sincere, laborious and interested to the task given to him.

Date : 12.08.2024

Divisional Signal & Telecom Engineer
South East Central Railway, Bilaspur

DIV. Sig. & Tele. Engineer
दक्षिण पूर्व मध्य रेलवे/बिलासपुर
South East Central Railway/Bilaspur

ABSTRACT PAGE

OBJECTIVE:

To get the vocational training at South East Central Railway, Bilaspur (C.G.), and for gaining experiences about working culture and environment on technical aspects (related to PRS, UTS, RAILNET, etc.) along with overall experience.

METHODOLOGY:

- During the vocational training, the instructor imparted information related to Indian Railways in simple and clear language on training aspects by adopting vocational and exposition approach. The information given by him verbally was written down by all the trainees and saved in their notes.
- During the training, all the trainees were taken to all the important places like office, workshop, store, control panel, and railway platform or junction for demonstration and inspection of important areas and their related equipment.
- After submitting the written report of the information and knowledge gained by the trainee during their training periods, the trainees were provided with internship certificate.

KEY OUTCOMES:

- In this training and internship, the trainee got necessary and essential information about the relevant topics of the Electronics & Communication Engineering branch and the work culture and all the necessary aspects around the communication field.
- We got a detailed understanding about the application, technical knowledge and field work of important points like UTS, PRS, IPIS, IPS, Battery Maintenance, OFC, RailNet, telephone exchange.

INDUSTRIALTRAINING REPORT

On

Internship at Indian Railway, Bilaspur

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Priyanshu Kumar

21030144

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Indian Railways in the *Electronics and Communication* domain provided a comprehensive understanding of the communication systems and electronic technologies employed in one of the world's largest railway networks. The primary focus was on the role of electronics and communication systems in ensuring efficient and safe railway operations, which included signal processing, communication protocols, and safety mechanisms.

Throughout the internship, I was introduced to various technological aspects, including:
*Railway Signaling Systems: Gained practical knowledge of modern electronic interlocking systems, automatic signaling, and the role of microprocessor-based signaling systems in managing train movements.
*Communication Networks: Hands-on experience with railway communication systems such as VHF (Very High Frequency) and UHF (Ultra High Frequency) wireless networks, GSM-R (Global System for Mobile Communications – Railway), and optical fiber-based communication setups that ensure realtime communication between trains, control rooms, and stationmasters.
*Train Control Systems: Studied the working of centralized traffic control (CTC) and automatic block signaling (ABS), focusing on how electronics and communication systems help improve operational efficiency and safety.
*Safety and Surveillance: Exposure to the role of electronic sensors, track circuits, and CCTV surveillance systems in enhancing railway security and safety. Observed how these technologies detect faults, monitor stations, and ensure passenger safety.
*Power Supply and Control Systems: Learned about the role of uninterrupted power supply (UPS) and control systems for signaling and telecommunication, ensuring reliability and availability of systems.

The internship provided valuable exposure to the integration of electronics, communication, and automation in railway operations, enhancing my understanding of how modern technology plays a crucial role in the functioning of Indian Railways. The hands-on experience and interactions with industry experts significantly deepened my knowledge of practical applications in the electronics and communication field, which will aid in my future career endeavors.

CERTIFICATE OF INTERNSHIP

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **PRIYANSHU KUMAR** Student of 6th Semester **Electronics & Communication** Engineering from Guru Ghasidas Vishwavidyalaya, **Koni Bilaspur, Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious, and interested to the task given to him.

Date: 08.07.2024

Sr. Div. Signal & Tele., Engg. (CO)

SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIALTRAINING REPORT

On

Internship at MSME Technology Centre, Durg

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Raviranjan Kumar

21030146

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Embedded Systems, Robotics, and Automation at MSME Durg. The training provided me with the opportunity to gain in-depth knowledge and practical experience in embedded systems, working with a variety of tools and platforms, including Keil, Proteus, Arduino IDE, and TIA Portal.

Throughout the training, I was involved in several hands-on projects such as the development of an Obstacle Avoidance Robot, a Bluetooth-Controlled Robot, and a Multi-Mode Robot Car, along with systems like the Smart Shopping Cart and Water Level Detection System. These projects involved interfacing hardware components such as LEDs, LCDs, 7-segment displays, and various sensors including Ultrasonic, IR, DHT, and Gas Sensors, along with communication protocols like MQTT, COAP, WebSocket, Zigbee, and Bluetooth.

Additionally, I explored Siemens PLC automation using the TIA Portal software. The experience significantly enhanced my technical skills in embedded systems, automation, and robotics, and allowed me to develop practical, real-world solutions applicable to various industries.

The training has been instrumental in bridging the gap between theoretical knowledge and practical application, and it has contributed greatly to my academic and professional development in the field of Electronics and Communication Engineering.

CERTIFICATE

Serial No 150060 Roll No DUST052200300060

MSME TECHNOLOGY CENTRE, DURG

Ministry Of Micro Small & Medium Enterprises,
A Govt. of India Society

Plot - 2D, Sector- B, Borai Industrial Growth Centre , Rasmada, Durg (C.G)-491001

This is to certify that

Mr./Miss. RAVIRANJAN KUMAR

has successfully completed the course

EMBEDDED IN ROBOTICS & AUTOMATION

The course comprises the following subjects

1. 8051 MICROCONTROLLER
2. IDE TOOLS USAGE
3. EMBEDDED C
4. INTERFACING MODULES
5. BASIC AUTOMATION
6. ROBOTICS PROJECTS

Period of Course From : 20.05.2024 To : 19.06.2024

Date of Award : 19.06.2024

Course co-ordinator

Training Incharge

INDUSTRIAL TRAINING REPORT

ON

WIRELESS (VERY HIGH FREQUENCY) COMMUNICATION

submitted in partial fulfillment for the award of the degree of

Bachelor of Technology

in

ELECTRONICS AND COMMUNICATION ENGINEERING

SUBMITTED BY

SAKSHAM SHRIVASTAVA

Roll number:21030147

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

राष्ट्रीय इस्पात निगम लिमिटेड
(भारत सरकार का उद्यम)
विशाखपट्टणम इस्पात संयंत्र
विशाखपट्टणम

RASHTRIYA ISPAT NIGAM LIMITED
(A Government of India Enterprise)
Visakhapatnam Steel Plant
Visakhapatnam

ISO 9001:2015, ISO 14001, ISO 50001, ISO 27001 & OHSAS 18001 Certified Company

अधिगम व विकास केंद्र
Learning & Development Centre
प्रमाणपत्र Certificate

यह प्रमाणित किया जाता है कि निम्नलिखित छात्र ने नीचे दिए गए विवरण के अनुसार राष्ट्रीय इस्पात निगम लिमिटेड-विशाखपट्टणम इस्पात संयंत्र में इंटर्नशिप/परियोजना कार्य पूरा किया है।
This is to certify that the following student has undergone Internship /Project Work in Rashtriya Ispat Nigam Limited-Visakhapatnam Steel Plant as detailed below:

छात्र का नाम Name of the Student	: **SAKSHAM SHRIVASTAVA**
कोर्स Course	: **BE/B TECH**
विश्वविद्यालय/कालेज का नाम Name of the University / College	: **GURU GHASIDAS VISWA VIDYALAYA,BILASPUR**
परियोजना का शीर्षक Project Title	: **STUDY OF WIRELESS COMMUNICATION SYSTEM**
इंटर्नशिप /परियोजना की अवधि Period of Internship/Project work	: **4 Weeks (from 27-05-2024 to 22-06-2024)**

उपर्युक्त कथित अवधि के दौरान उनका आचरण संतोषजनक पाया गया। During the aforestated period his / her conduct was found to be SATISFACTORY.

100029956
पंजीकरण नं.
Registration No

M Ganesh Babu
AGM (Trg.)

Abstract

This internship report documents my experience at Vizag Steel Plant, where I worked on a project related to wireless (very high frequency) communication. The plant's vast and complex operations rely heavily on effective communication systems, and my project aimed to explore the application of wireless communication technologies in this context.

During my internship, I gained hands-on experience with very high frequency (VHF) communication systems, including installation, configuration, and troubleshooting. I also had the opportunity to work with various wireless communication protocols and devices, such as radios, antennas, and repeaters.

The project's primary objective was to design and implement a wireless communication system for real-time monitoring and control of the plant's critical processes. I conducted a thorough analysis of the plant's communication requirements and identified areas where wireless communication could enhance efficiency and safety.

The internship provided valuable insights into the practical applications of wireless communication in an industrial setting. I developed a deeper understanding of the technical challenges and considerations involved in implementing wireless communication systems in a complex environment like Vizag Steel Plant.

This report presents my findings, including the design and implementation of the wireless communication system, performance analysis, and recommendations for future improvements. The project's outcomes have the potential to enhance the plant's operational efficiency, safety, and productivity.

INDUSTRIAL TRAINING REPORT

ON

VLSI

ON

AD INFOCOMM SYSTEMS PVT.LTD

(15/05/2024 to15/06/2024)

Submitted in partial fulfillment of requirement for the award of the

Degree of

Bachelor of Technology

In

ELECTRONICS AND COMMUNICATION ENGINEERING

BY

SHIKHA SIDAR

Roll Number: 21030150

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA
BILASPUR, CHHATTISGARH- 495009

SESSION 2024-25

AD Infocom Systems

62, Bajrang Nagar, Manewada Road, Nagpur – 440027
Contact No.: 9860455757 **Email:** adinfocomsystems@gmail.com
Website: www.adinfocomsystems.in

Approved By
All India Council For Technical Education
AICTE(NEW DELHI)

Ref. No. - ADIS/2024/110 **Date - 16/06/2024**

Internship Certificate

We are happy to announce that **Shikha Sidar** has successfully completed the internship at AD Infocom Systems in the domain of **"VLSI"** from **15/05/2024** to **15/06/2024**.

During internship, you have successfully completed all the modules and project work.

We wish you all the best for your future endeavors.

Thank you.

Prabhakar Dorge
Managing Director
AD Infocom Systems

AD Infocom Systems Seal Nagpur

ABSTRACT

The internship focused on developing a vending machine system using Verilog, which is a hardware description language (HDL) commonly used in digital design. A vending machine system is a state machine that manages the selection, payment, and dispensing of items, simulating the operations of an actual vending machine. In this project, Verilog was used to model the logic and control flow for handling user inputs, determining the correct output based on payment and selection, and controlling the dispensing mechanism. The vending machine system was likely implemented using a finite state machine (FSM), which consists of states such as idle, selection, payment, and dispense. Each state corresponds to a specific operation within the vending process, ensuring a smooth flow between user interaction and the internal mechanisms. Verilog enabled the precise modeling of the machine's behavior, from detecting valid inputs and managing transactions to ensuring proper state transitions. The use of Verilog ensures a reliable, predictable system that can be synthesized into hardware, offering a fast and efficient solution for embedded applications. This type of project is often used in embedded systems or FPGA-based designs where precise control of logic is needed. Overall, the vending machine system implemented in Verilog is a practical and efficient way of simulating real-world control systems.

INDUSTRIAL TRAINING REPORT

On

“ VOCATIONAL TRAINING ”

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

SHUBHAM KUMAR SAHU

(21030151)

B.Tech. VII Semester

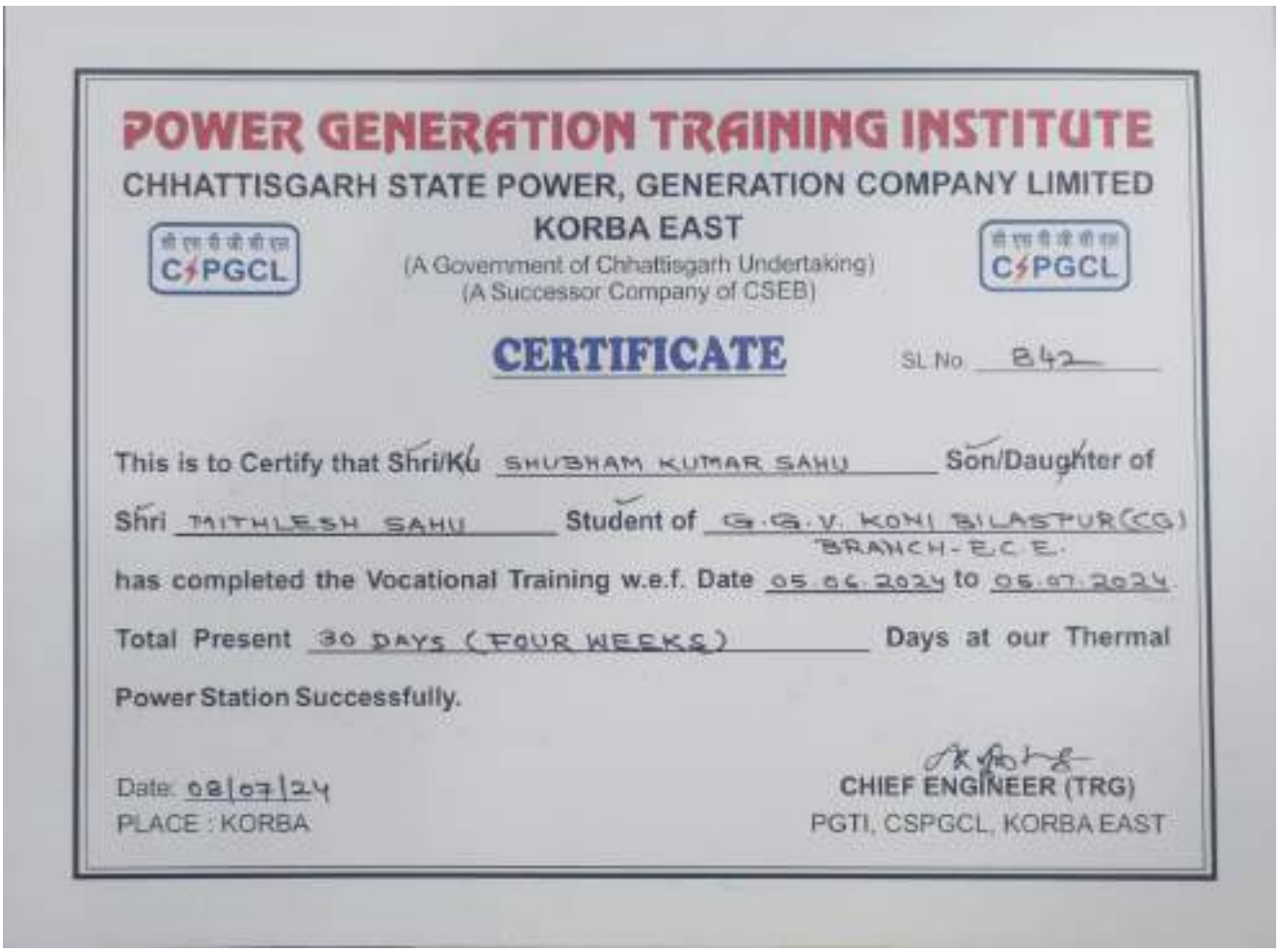
DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGSCH

OOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Certificate of Training



POWER GENERATION TRAINING INSTITUTE

CHHATTISGARH STATE POWER, GENERATION COMPANY LIMITED

KORBA EAST

(A Government of Chhattisgarh Undertaking)
(A Successor Company of CSEB)

CERTIFICATE

Sl. No 842

This is to Certify that Shri/Ku SHUBHAM KUMAR SAHU Son/Daughter of Shri MITHLESH SAHU Student of G.G.V. KONI BILASTPUR(CG) BRANCH-E.C.E. has completed the Vocational Training w.e.f. Date 05.06.2024 to 05.07.2024 Total Present 30 DAYS (FOUR WEEKS) Days at our Thermal Power Station Successfully.

Date: 08/07/24
PLACE : KORBA

CHIEF ENGINEER (TRG)
PGTI, CSPGCL, KORBA EAST

Abstract

The industrial training program at Hasdeo Thermal Power Station (HTPS), Korba West was an invaluable experience that provided a comprehensive understanding of the Control and Instrumentation (C&I) Department. As an undergraduate student in Electronics and Communication Engineering, this training allowed me to apply theoretical concepts in practical industrial scenarios, enhancing my technical skills significantly. Over the course of a month, I was exposed to key areas such as instrumentation, control systems, automation, protection mechanisms, and communication technologies, all essential for the efficient and safe operation of a thermal power plant.

A significant focus of the training was on measurement systems, crucial for monitoring and controlling processes within the plant. I gained practical knowledge of essential parameters such as temperature, pressure, flow, and level measurements, all vital for ensuring plant efficiency and safety. I was introduced to various temperature measurement devices, including Resistance Temperature Detectors (RTDs), thermocouples, and bimetallic thermometers. RTDs are used for low-range temperature measurement based on resistance variation, while thermocouples measure high-range temperatures by generating voltage in response to temperature differences. This understanding was critical for maintaining heat balance and assessing energy conversion efficiency. In addition to temperature, I learned about pressure measurement, essential for monitoring steam and water pressures in high-pressure zones like boilers. I discovered the functions of pressure gauges, differential pressure transmitters, and capacitive pressure sensors in maintaining safe operating pressures. The training also covered flow measurement techniques using differential pressure flow meters and magnetic flow meters to measure the flow of water, steam, and gases, which optimize combustion efficiency.

Moreover, I was trained in level measurement devices such as glass-tube gauges and magnetic level indicators, which are critical for monitoring fluid levels in tanks. The training introduced me to various control devices, including electrically actuated, pneumatically actuated, and hydraulically actuated valves, ensuring operational stability. Another key component was automation through Programmable Logic Controllers (PLCs) and Proportional-Integral-Derivative (PID) controllers, which utilize feedback loops to maintain stability. Hands-on experience with the Supervisory Control and Data Acquisition (SCADA) system allowed me to visualize real-time data and manage alarm systems effectively.

In conclusion, the industrial training at HTPS provided me with a well-rounded understanding of the systems and technologies involved in operating a thermal power plant, deepening my technical knowledge and preparing me for future challenges in the energy sector with confidence.

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Siddharth Kamal Singh Rusiya

21030152

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report takes a pedagogical stance in demonstrating how results from theoretical computer science may be applied to yield significant insight into the behavior of the devices computer systems engineering practice seeks to put in place, and that this is immediately attainable with the present state of the art.

The focus for this detailed study is provided by the type of solid state signaling and various communication systems currently being deployed throughout mainline railways. Safety and system reliability concerns dominate in this domain. With such motivation, two issues are tackled: the special problem of software quality assurance in these data-driven control systems, and the broader problem of design dependability. In the former case, the analysis is directed towards proving safety properties of the geographic data which encode the control logic for the railway interlocking; the latter examines the fidelity of the communication protocols upon which the distributed control system depends.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **SIDDHARTH KAMAL SINGH RUSIYA** Student of 6th Semester **Electronics & Communication** Engineering from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.)** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious and interested to the task given to him.

Date: 08.06.2024

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (क-...)
Sr. Div. Sig. & Tele. Engineer (Co.Ord.)
दक्षिण पूर्व मध्य रेलवे / बिलासपुर
South East Central Railway/Bilaspur

SR. DIV. SIGNAL & TELE. ENGR. (CO)

SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIALTRAINING REPORT

On

BILASPUR DIVISION OF SOUTH
EAST CENTRAL RAILWAY

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Siddharth Rajesh Mishra

21030153

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY
GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report takes a pedagogical stance in demonstrating how results from theoretical computer science may be applied to yield significant insight into the behavior of the devices computer systems engineering practice seeks to put in place, and that this is immediately attainable with the present state of the art.

The focus for this detailed study is provided by the type of solid state signaling and various communication systems currently being deployed throughout mainline railways. Safety and system reliability concerns dominate in this domain. With such motivation, two issues are tackled: the special problem of software quality assurance in these data-driven control systems, and the broader problem of design dependability. In the former case, the analysis is directed towards proving safety properties of the geographic data which encode the control logic for the railway interlocking; the latter examines the fidelity of the communication protocols upon which the distributed control system depends.

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Mr. **SIDDHARTH RAJESH MISHRA** Student of 6th Semester **Electronics & Communication** Engineering from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur (C.G.)** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024. in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

He was found sincere, laborious and interested to the task given to him.

Date: 08.06.2024

वरिष्ठ मण्डल संकेत एवं दूरसंचार इंजीनियर (क- ~~~)
Sr. Div. Sig. & Tele. Engineer (Co.Ord.)
दक्षिण पूर्व मध्य रेलवे / बिलासपुर
South East Central Railway/Bilaspur

SR. DIV. SIGNAL & TELE. ENGR. (CO)
SOUTH EAST CENTRAL RAILWAY ,BILASPUR

INDUSTRIALTRAINING REPORT

On

“Evaluation of Industrial Training at South East Central Railway”

Submitted in the partial fulfillment for the award of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

SMRITI KUMARI

21030154

B.Tech. VII Semester

DEPARTMENTOFELECTRONICSANDCOMMUNICATIONENGINEERINGS

CHOOLOFSTUDIESINENGINEERINGANDTECHNOLOGY

GURUGHASIDASVISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

Certificate Of Training

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Ms. **SMRITI KUMARI** Student of 6th Semester **Electronics & Communication Engineering** from **Guru Ghasidas Vishwavidyalaya, Koni, Bilaspur , Chhattisgarh** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/05/2024 to 08/06/2024 in :-

1. UTS
2. PRS
3. IPIS
4. TELEPHONE EXCHANGE
5. RAILNET
6. OFC
7. BATTERY MAINTENANCE
8. IPS

She was found sincere, laborious and interested to the task given to her.

Date: 08.06.2024

Div. Signal & Tele. Engg.
SOUTH EAST CENTRAL RAILWAY, BILASPUR

ABSTRACT

This report presents an evaluation of industrial training at South East Central Railway, Bilaspur (C.G.), aimed at gaining technical knowledge on systems such as the Passenger Reservation System (PRS), Unreserved Ticketing System (UTS), and RailNet. The training, delivered in a straightforward manner, allowed trainees to document the information while visiting key locations such as workshops, control panels, and railway platforms for hands-on experience. Upon submitting reports, trainees received internship certificates. The key outcomes of the training included practical insights into systems like UTS, PRS, Integrated Passenger Information System (IPIS), battery maintenance, optical fiber communication (OFC), and telephone exchanges. This experience provided valuable knowledge and skills in communication technology, laying a strong foundation for future work in electronics and communication engineering.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Tandyala Guna Shekar

21030155

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नाम-530012, अ.प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8842/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. TANDYALA GUNA SHEKAR S/o Shri. TANDYALA SHANKAR RAO,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024.**

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good.**

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी. मिश्रा/K.P. MISHRA
उप महा प्रबंधक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
भीएचईएल, एचपीवीपी, विशाखापत्तनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTARCT:

Goals:

To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
to improve participants' proficiency with CNC machine programming and operation.
to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
Exercises Under guidance: Under the watchful eyes of trainers, participants completed practical assignments.
Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

Principal Results:

Enhanced Knowledge: Participants developed a strong grasp of programming, machine operation, and CNC concepts.
Enhanced Competencies: Participants gained expertise in utilizing CNC hardware and software for various manufacturing jobs. Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols.
All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INDUSTRIAL TRAINING REPORT

ON

WIRELESS (VERY HIGH FREQUENCY) COMMUNICATION

submitted in partial fulfillment for the award of the degree of

Bachelor of Technology

in

ELECTRONICS AND COMMUNICATION ENGINEERING

SUBMITTED BY

THAKUR KISHLAY

ROLL Number: 21030156

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

राष्ट्रीय इस्पात निगम लिमिटेड
(भारत सरकार का उद्यम)
विशाखपट्टणम इस्पात संयंत्र
विशाखपट्टणम

RASHTRIYA ISPAT NIGAM LIMITED
(A Government of India Enterprise)
Visakhapatnam Steel Plant
Visakhapatnam

ISO 9001:2015, ISO 14001, ISO 50001, ISO 27001 & OHSAS 18001 Certified Company

अधिगम व विकास केंद्र
Learning & Development Centre
प्रमाणपत्र Certificate

यह प्रमाणित किया जाता है कि निम्नलिखित छात्र ने नीचे दिए गए विवरण के अनुसार राष्ट्रीय इस्पात निगम लिमिटेड-विशाखपट्टणम इस्पात संयंत्र में इंटर्नशिप/परियोजना कार्य पूरा किया है।
This is to certify that the following student has undergone Internship /Project Work in Rashtriya Ispat Nigam Limited-Visakhapatnam Steel Plant as detailed below:

छात्र का नाम Name of the Student	: **THAKUR KISHLAY**
कोर्स Course	: **BE/B TECH**
विश्वविद्यालय/कालेज का नाम Name of the University / College	: **GURU GHASIDAS VISWA VIDYALAYA,BILASPUR**
परियोजना का शीर्षक Project Title	: **STUDY OF WIRELESS COMMUNICATION SYSTEM**
इंटर्नशिप /परियोजना की अवधि Period of Internship/Project work	: **4 Weeks (from 27-05-2024 to 22-06-2024)**

उपर्युक्त कथित अवधि के दौरान उनका आचरण संतोषजनक पाया गया। During the aforestated period his / her conduct was found to be SATISFACTORY.

100029734
पंजीकरण सं.
Registration No

M Ganesh Babu
AGM (Trg.)

Abstract

This internship report documents my experience at Vizag Steel Plant, where I worked on a project related to wireless (very high frequency) communication. The plant's vast and complex operations rely heavily on effective communication systems, and my project aimed to explore the application of wireless communication technologies in this context.

During my internship, I gained hands-on experience with very high frequency (VHF) communication systems, including installation, configuration, and troubleshooting. I also had the opportunity to work with various wireless communication protocols and devices, such as radios, antennas, and repeaters.

The project's primary objective was to design and implement a wireless communication system for real-time monitoring and control of the plant's critical processes. I conducted a thorough analysis of the plant's communication requirements and identified areas where wireless communication could enhance efficiency and safety.

The internship provided valuable insights into the practical applications of wireless communication in an industrial setting. I developed a deeper understanding of the technical challenges and considerations involved in implementing wireless communication systems in a complex environment like Vizag Steel Plant.

This report presents my findings, including the design and implementation of the wireless communication system, performance analysis, and recommendations for future improvements. The project's outcomes have the potential to enhance the plant's operational efficiency, safety, and productivity.

INDUSTRIALTRAINING REPORT

On

Internship at MSME Technology Centre, Durg

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Ujjwal Ranjan Choubey

21030157

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in Embedded Systems, Robotics, and Automation at MSME Durg. The training provided me with the opportunity to gain in-depth knowledge and practical experience in embedded systems, working with a variety of tools and platforms, including Keil, Proteus, Arduino IDE, and TIA Portal.

Throughout the training, I was involved in several hands-on projects such as the development of an Obstacle Avoidance Robot, a Bluetooth-Controlled Robot, and a Multi-Mode Robot Car, along with systems like the Smart Shopping Cart and Water Level Detection System. These projects involved interfacing hardware components such as LEDs, LCDs, 7-segment displays, and various sensors including Ultrasonic, IR, DHT, and Gas Sensors, along with communication protocols like MQTT, COAP, WebSocket, Zigbee, and Bluetooth.

Additionally, I explored Siemens PLC automation using the TIA Portal software. The experience significantly enhanced my technical skills in embedded systems, automation, and robotics, and allowed me to develop practical, real-world solutions applicable to various industries.

The training has been instrumental in bridging the gap between theoretical knowledge and practical application, and it has contributed greatly to my academic and professional development in the field of Electronics and Communication Engineering.

CERTIFICATE

Serial No 150061

Roll No DUST152406000061

MSME TECHNOLOGY CENTRE, DURG

Ministry Of Micro Small & Medium Enterprises,
A Govt. of India Society

Plot - 2D, Sector- B, Borai Industrial Growth Centre , Rasmada, Durg (C.G)-491001

This is to certify that

Mr./Miss. UJJWAL RANJAN CHOUBEY

has successfully completed the course

EMBEDDED IN ROBOTICS & AUTOMATION

The course comprises the following subjects

1. 8051 MICROCONTROLLER
2. IDE TOOLS USAGE
3. EMBEDDED C
4. INTERFACING MODULES
5. BASIC AUTOMATION
6. ROBOTICS PROJECTS

Period of Course From : 26.05.2024 To : 25.06.2024

Date of Award : 26.06.2024

Course co-ordinator

Training Incharge

INDUSTRIAL TRAINING REPORT
On

STUDY ON PLC AND CNC MACHINE

Submitted in partial fulfilment for the award
Of the degree of Bachelor of Technology

In

Electronics And Communication Engineering
By

VALLURU NIKHIL
(21030158)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING,
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY,
GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR (C.G)
SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
रामचंद्रापुरम, हैदराबाद
मानव संसाधन विकास केंद्र

BHARAT HEAVY ELECTRICALS LIMITED
RAMACHANDRAPURAM, HYDERABAD-502032
Human Resource Development Centre

Reg No: 24ENER7293 **Date:** 29/06/2024

PROJECT TRAINING CERTIFICATE

This is to certify that Mr./Ms./Mrs. VALLURU NIKHIL
S/o VALLURU SURENDRA KUMAR
with college id no: 2103058 studying in GURU GHASIDAS
VISHNAVIDYALAYA, KONI, BILASPUR, CHATTISGARH
pursuing B.TECH in ELECTRONICS & COMMUNICATION ENGG
discipline had undergone project training from 30/5/2024 to
29/06/2024. The title of the project training as per our records is
STUDY OF PLC ON CNC MACHINE

Project training in-charge

ABSTRACT

Goals:

- To impart both theoretical and practical understanding of computer numerical control (CNC) systems to the attendees.
- to improve participants' proficiency with CNC machine programming and operation.
- to increase manufacturing operations' efficiency and productivity.

Techniques:

Theoretical Sessions: Talks on safety procedures, programming languages, machine components, and CNC principles.
Practical Demonstrations: Practical use of a variety of CNC machines, such as milling and lathe machines.
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Case Studies: To demonstrate the use of CNC technology, real-world examples were discussed.

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Confidence Boosted: Participants' self-assurance in their aptitude to handle and troubleshoot CNC equipment increased.
Enhanced Productivity: Participants gained knowledge on how to optimize CNC procedures to cut waste and increase productivity.
Enhanced Safety: To reduce mishaps and injuries, participants received training on safety protocols. All things considered, the CNC systems training program was effective in reaching its goals and giving participants the tools they needed to succeed in careers using CNCs.

INTRODUCTION:

Industrialization has triggered rapid advances in technology all over the world and has placed the need for machine tools to be controlled to very high levels of accuracy. Thus the concept of Computer Numerical Control arose which has revolutionised machine tooling and made it possible to machine intricate jobs with high accuracy.

Machine tools are now controlled by CNC systems. The basic advantage of this over conventional machines is the exibility being oered by the CNC system. This control system is a closed loop position control system where the position of the machine tool is controlled. The control system interfaced with the machine tool issues appropriate signals to various drives of the machine tool, which results in precise motion of these axes for accurate machining. The drives used are either DC or AC drives which provide better speed control features using electronic control with thyristor stacks.

The numerical data (set of commands) is fed into the control system through a suitable input medium (either alphanumeric keyboard of control system or oppy diskette). The data is stored in the data storage area and all the comparisons are computed in the computational area and distributed in respective servo drive axes. The servo drive gets activated and moves the axis slides and spindle. The position feedback transducer at each slide monitors the instantaneous position of the slide and gives the feedback to the control system where the instantaneous slide position is compared with the commanded position.

The CNC machine basically entails three main regions

- The control system
- The drives (driving elements) and
- The machine tool

In the dissection that follows a complete insight into these functions of the CNC system have been taken up with the interfacing of each to the other.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Vasista Rohanth Peela

21030159

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नम-530012, अ.प्र.,भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8839/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. VASISTA ROHANTH PEELA S/o Shri. P V V NOOKESWARA RAO,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)

के.पी. मिश्रा/K.P. MISHRA
उप महा प्रबंधक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विसाखापत्तनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

ABSTARCT:

Goals:

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INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Vayas lohanth Peela

21030162

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसाखापत्तनम-530012, अ. प्र., भारत.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8840/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. VYAS LOHANTH PEELA S/o Shri. P V V NOOKESWARA RAO,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024.**

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good.**

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)
के.पी. मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विशाखापत्तनम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

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INDUSTRIAL TRAINING REPORT

On

"VOCATIONAL TRAINING"

East Central Railway

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Aanchal Kumari

Roll No.: 21030164

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR(C.G.)

SESSION:2024-25

INTERNSHIP CERTIFICATE

EAST CENTRAL RAILWAY

CERTIFICATE

Ref No. 40/2024

It is certified that *Ms. Aanchal Kumari* (Roll No.21030164) 6th Sem., B.Tech. (ECE) of *Guru Ghasidas Vishwavidyalaya , Bilaspur* has been imparted Internship at *S&T Deptt. ECR, Danapur* from 10.06.2024 to 07.07.2024.

The student has undergone training in core activities of Railways like: **Digital System (Networking & Maintenance) Telephone Exchange, Optical Fibre Communication System, Working of Railnet, Quad Cable Communication system, Public Announcement System, PRS/UTS working system, Mobile Train Radio Communication, e-office and HRMS, Signal Interlocking System, Basic Signaling System etc.** During this session.

I wish her all success in life.

(Prabhat Kumar)
Asstt. Personnel Officer/MPP
East Central Railway, Hajipur

Place: Hajipur
Date : 08.07.2024

ABSTRACT

During my internship at Indian Railways, I gained practical experience in critical digital and communication systems that support railway operations. My focus was on maintaining the Optical Fibre Communication System and Telephone Exchange, while also ensuring the reliable performance of the Railnet infrastructure and Quad Cable Communication System.

I worked with the Public Announcement System and explored the functionality of the Passenger Reservation System (PRS) and the Unreserved Ticketing System (UTS). Additionally, I was introduced to Mobile Train Radio Communication, a key system for improving communication safety between trains and control centers. I also became familiar with digital platforms such as the e-office system and Human Resource Management System (HRMS), which streamline administrative operations. Furthermore, I gained knowledge of the Signal Interlocking System and basic signaling techniques, both essential for the safe and efficient movement of trains. This internship provided me with a well-rounded understanding of railway communication, digital management systems, and signaling technology.

INDUSTRIALTRAINING REPORT

On

CNC SYSTEM

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Gugulothu Santhosh Nayak

21030165

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR, CHHATTISGARH

SESSION:2024-25

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
हेवी प्लेट्स एंड वेसल्स प्लांट, विसखापत्नाम-530012, अ.प्र.,भारात.
Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant, Visakhapatnam – 530012, A.P., INDIA

Ref: HRDC/B/07/2024 **CERT.NO:8837/16.05.2024**

Date: 24.06.2024

CERTIFICATE

This is to certify that **Mr. GUGULOTHU SANTHOSH NAYAK S/o Shri. GUGULOTHU DEVASINGH,** studying **B.Tech (ECE)** in **Guru Ghasidas University, Bilaspur** has done **INTERNSHIP** in **BHEL, HPVP, Visakhapatnam** from **16-05-2024 to 15-06-2024**.

During the above period, his/her **CONDUCT & PERFORMANCE** were found to be **Very Good**.

24/6/24

(K P Mishra)
Dy. General Manager (HRDC)
के.पी.मिश्रा/K.P. MISHRA
उप महा प्रबन्धक (एचआरडीसी एवं सुरक्षा)
DGM (HRDC & Security)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530012
BHEL, HPVP, VISAKHAPATNAM-530 012

Tel. No. 0891-2881478, e-mail: kpm@bhel.in website: www.bhel.com

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INDUSTRIALTRAINING REPORT

On

“VOCATIONAL TRAINING”

South East Central Railway

Submitted in the partial fulfillment for the award

of the Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Yogendra sahu

21030166

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR(C.G.)

SESSION:2024-25

SOUTH EAST CENTRAL RAILWAY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. YOGENDRA SAHU** , Student of 6th Semester, School of Studies in **(Electronics & Communication) Engineering** from **Guru Ghansidas Vishwavidyalaya,Koni,Bilaspur** has attended Bilaspur Division of South East Central Railway for Vocational Training from Dated 20/07/2024 to 08/06/2024, in :-

1. **UTS**
2. **PRS**
3. **IPIS**
4. **TELEPHONE EXCHANGE**
5. **RAILNET**
6. **OFC**
7. **BATTERY MAINTENANCE**
8. **IPS**

He was found sincere, laborious, and interested to the task given to him.

Date: 09.06.2024

Divisional Signal & Telecom Engg.
SOUTH EAST CENTRAL RAILWAY, BILASPUR

Abstract

This internship report presents my experiences and insights gained during my tenure at South East Central Railway, focusing on several key technical areas: Unified Ticketing System (UTS), Passenger Reservation System (PRS), Integrated Passenger Information System (IPIS), telephone exchange operations, RailNet infrastructure, Optical Fiber Communication (OFC), battery maintenance, and Integrated Power Supply (IPS) systems.

The report begins with an overview of each system's functionality and significance in improving operational efficiency and enhancing the passenger experience. I engaged in hands-on training and observation, which allowed me to understand the technical processes involved in maintaining and troubleshooting these systems. For example, I learned how UTS streamlines ticketing, while PRS enhances reservation accuracy and customer service.

Additionally, I explored the workings of the telephone exchange and RailNet, which facilitate communication and data transfer within the railway network. My work with OFC highlighted its role in providing reliable internet connectivity, while the battery maintenance and IPS systems underscored the importance of power reliability in operations.

Throughout my internship, I encountered various challenges, including technical limitations and issues related to system integration. I have included recommendations for improving system reliability and service delivery, which could further enhance operational efficiency.

Ultimately, this internship deepened my understanding of railway operations and underscored the vital role of technology in modernizing railway services, preparing me for a future career in this dynamic field.

INDUSTRIALTRAINING REPORT

On

Internship at Bharat Heavy Electricals Limited, Kanpur

Submitted in the partial fulfillment for the award of the

Degree of Bachelor of Technology

In

Electronics and Communication Engineering

By

Sakshi Patel

21030168

B.Tech. VII Semester

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY

GURU GHASIDAS VISHWAVIDYALAYA ,BILASPUR(C.G.)

SESSION:2024-25

ABSTRACT

This report presents the key experiences and learnings from my industrial training in During the internship at Bharat Heavy Electricals Limited (BHEL), I had the opportunity to gain practical exposure in the field of heavy electrical engineering, focusing on the development and manufacturing of power equipment and systems. This training provided an in-depth understanding of BHEL's industrial operations, ranging from design and engineering to manufacturing and quality control processes.

The primary objective of this internship was to familiarize myself with the production processes involved in power generation equipment, such as turbines, transformers, and boilers. Over the course of the internship, I was exposed to the functioning of BHEL's power plant facilities, assembly lines, and testing labs, which helped me develop a solid understanding of real-world engineering applications.

Key areas of learning included:

Manufacturing Processes: I gained insights into the fabrication and assembly of heavy electrical components and machinery.
Power Plant Engineering: Observing the operation and maintenance of thermal and hydroelectric power generation systems.
Quality Control: Exposure to BHEL's quality assurance processes to ensure product reliability and efficiency.
Project Management: Participation in ongoing projects gave me an understanding of project timelines, safety regulations, and resource management.

The internship also included interactions with seasoned professionals, providing guidance and hands-on experience with cutting-edge technologies used in the power sector. Overall, the internship enhanced my technical knowledge and gave me valuable industry insights, which will be instrumental in my future career as an engineer.

CERTIFICATE

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(भारत सरकार का उपक्रम / A Government of India Undertaking)
CIN: L74899DL1964GOI004281
(पावर सेक्टर उत्तरी क्षेत्र / Power Sector Northern Region)
(भेल सदन, नवम तल/ BHEL Sadan, 9th Floor)
प्लॉट नंबर 25, सेक्टर-16ए, नोएडा, यूपी-201301 / Plot No. 25, Sector-16A, Noida, UP-201301)

BHEL:PSNR:HR: 23 : 08 : 03 Dated : 18 July, 2024

TO WHOM SO EVER IT MAY CONCERN

It is certified that Ms. Sakshi Patel, student of B.Tech of Guru Ghasidas Vishwavidyalaya, Bilaspur has successfully completed her Summer training at BHEL PS-NR, Panki Site under the guidance of Mr Brahmjeet Singh, Sr. Manager, Panki site from 15th Jun to 15th Jul 2024 in partial fulfilment of her academic course.

We wish her success in all future endeavours.

Monideepa Roy

(Monideepa Roy)
Sr. Manager (HR)

INDUSTRIAL TRAINING REPORT
On

Zone Computation On Map Using Python

Submitted in partial fulfilment for the award
Of the degree of Bachelor of Technology

In

Electronics And Communication Engineering
By

KORIKANA ANITHA
(21030169)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING,
SCHOOL OF STUDIES IN ENGINEERING AND TECHNOLOGY,
GURU GHASIDAS VISHWAVIDYALAYA,BILASPUR (C.G)
SESSION:2024-25

भारत इलेक्ट्रॉनिक्स
BHARAT ELECTRONICS
QUALITY TECHNOLOGY INNOVATION

Skill India
कौशल भारत - कुशल भारत

BHARAT ELECTRONICS LIMITED

(A Govt. of India Enterprise, Ministry of Defence)
Jalahalli Post, Bengaluru - 560 013, India

CENTRE FOR LEARNING AND DEVELOPMENT

Certificate

This is to certify that

Sri./Smt/Kum KORIKANA ANITH

Ref No. 1410/CLD/HR/2024-25/100

student of GURU GHASIDAS VISHWAVIDYALAYA BILASPUR

carried out Project Work/Internship on "ZONE COMPUTATION ON MAP" USING PYTHON

in SOFTWARE

SBU/CSG of BEL, Bengaluru from 15-05-2024

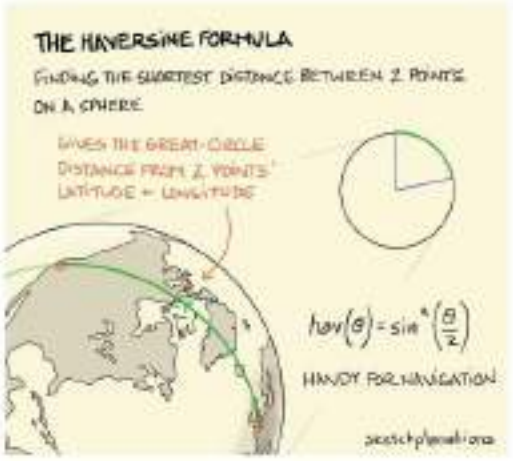
to 14-06-2024

He/She was regular and punctual in his/her attendance and his/her conduct was satisfactory during the period.

Project / Internship Guide

Head (HR/CLD)

Date : 14/06/24
Place : Bengaluru



EMBEDDED SYSTEM

Zone Computation On Map Using Python

ABSTRACT

The project focuses on the implementation of an embedded system that calculates the distance between two geographical points using their latitude and longitude coordinates. This system is useful for various applications such as navigation systems, asset tracking, and geofencing. The system utilizes a microcontroller, GPS module, and display module to fetch GPS data, calculate the distance using the Haversine formula, and display the results. The implementation involves hardware setup, firmware development, testing, and validation. The system demonstrates the practical application of embedded systems in solving real-world problems related to geographical calculations.

KORIKANA ANITHA

INTRODUCTION

The rapid advancements in technology have significantly influenced various aspects of our daily lives, particularly in the realm of navigation and location-based services. The ability to accurately calculate distances between geographical locations is crucial for numerous applications, including navigation systems, asset tracking, geofencing, and location-based services. This project focuses on the implementation of distance calculation using latitude and longitude coordinates within an embedded system.

Embedded systems are specialised computing systems that perform dedicated functions within larger systems. They are integral to modern electronics, offering the benefits of efficiency, reliability, and cost-effectiveness. When combined with Global Positioning System (GPS) technology, embedded systems can provide precise location data, enabling a wide range of applications that require geographical awareness.

The core objective of this project is to develop an embedded system capable of calculating the distance between two geographical points using their latitude and longitude coordinates. This is achieved through the implementation of the Haversine formula, a well-known mathematical formula used to determine the shortest distance over the Earth's surface. The Haversine formula takes into account the curvature of the Earth, providing an accurate measure of distance between two points defined by their latitude and longitude.

To realise this objective, the project employs a microcontroller interfaced with a GPS module. The GPS module provides real-time latitude and longitude data, which is then processed by the microcontroller. The calculated distances are displayed on an output interface, such as an LCD or OLED screen, enabling users to visualise the information easily.

This project report details the design, implementation, and testing phases of the embedded system for distance calculation. It begins with an overview of the theoretical background, including the Haversine formula and its relevance. Following this, the hardware and software components used in the system are described in detail. The report then outlines the integration process of the GPS module with the microcontroller, along with the algorithm for distance calculation. Finally, the report presents the results of the system's performance, discusses potential applications, and suggests future improvements.

By successfully implementing this project, we demonstrate the practical application of embedded systems in solving real-world problems. The ability to accurately calculate distances using GPS coordinates has significant implications for various industries, enhancing the functionality and efficiency of navigation, tracking, and location-based systems. This project not only showcases the technical proficiency required to develop such a system but also underscores the importance of integrating hardware and software components to achieve reliable and accurate outcomes.