Development of Gamified VR Rehabilitation for Stroke Patients

Project-III - (IT208PPC31) report submitted to

Guru Ghasidas Vishwavidylaya

in partial fulfilment for the award of the degree of

Bachelor of Technology

in

Information Technology

by

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(21036109, 21036108, 21036121)

Under the supervision of

Dr. Ankit Kumar

Department of Information Technology

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April 03 ,2025

April, 2025

DEPARTMENT OF INFORMATION TECHNOLOGY

GURU GHASIDAS VISHWAVIDYLAYA

BILASPUR - 495009, INDIA

CERTIFICATE

This is to certify that the project report entitled "**Development of Gamified VR Rehabilitation for Stroke Patients**" submitted by **Aman Pratap Singh, Agadi Jayasri, Divya Smreeti** (Roll No. 21036109, 21036108, 21036121) to Guru Ghasidas Vishwavidylaya towards partial fulfilment of requirements for the award of degree of Bachelor of Technology in Information Technology is a record of bonafide work carried out by him under my supervision and guidance during April 03 ,2025.

Date: April 03 , 2025

Place: Bilaspur

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Abstract

Name of the student: **Aman Pratap Singh, Agadi Jayasri, Divya Smreeti**

Roll No: **21036109, 21036108, 21036121**

Degree for which submitted: **Bachelor of Technology**

Department: **Department of Information Technology**

Thesis title: **Development of Gamified VR Rehabilitation for Stroke Patients**

Thesis supervisor: **Dr. Ankit Kumar**

Month and year of thesis submission: **April, 2025**

This project outcome explores the positive impact of virtual reality (VR) and Gamification technologies for the treatment of Stroke Patients having hand paralysis using an immersive game " Fruitopia Expedition". This research evaluates the effectiveness of a 45-day VR rehabilitation program consisting of 15 immersive rehabilitation therapy sessions, to improve hand mobility and general motor skills functionality, and improve confidence in stroke patients. The result validates the 13.84 percent increase in immersion levels and the 24.71 percent reduction in motion sickness. The Physical assessments representing 35 percent to 40 percent improvement in MMT (Manual Muscle Testing) and an improvement in grip strength followed by 20 percent to 25 percent improvement in FTT (Finger Tapping Test), ROM (Range of Motion) and FHT (Functional Hand Test). These results show a great improvement in hand strength, coordination, flexibility, and motor control and the correlation analysis represents strong positive relationships between pre- and post-intervention

gamified therapy scores across all tests. The research findings underscore the potential of VR therapy to significantly improve the physical strength of stroke survivors and also enhance patient engagement by using gamification and reducing motion sickness over the time of multiple therapy sessions.