



Internship Project Report

On

**MATHEMATICAL MODELLING AND CONTROL OF
BIOMIMETIC AUTONOMOUS UNDERWATER VEHICLE**

Submitted to

DEPARTMENT OF ELECTRICAL ENGINEERING & AEROSPACE ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY

(IIT KHARAGPUR)

For

COMPLETION OF INTERNSHIP

Submitted by

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Under the Guidance of

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&

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Kharagpur-721302

15th May 2024 – 30th June 2024



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ACKNOWLEDGEMENT

ABSTRACT

INTRODUCTION

- BAUVs
- Advantages of BAUVs
- Disadvantages of BAUVs

ABOUT THE PROJECT

- About BAUVs
- Forces Involved in BAUVs
- Types of Motion Involved in BAUVs
- Key Parts of BAUVs
- Diagram Representation

MATHEMATICAL MODELLING OF BAUVs

- Introduction
- Coordinate System
- Degree of Freedom (Dof)
- Kinematic Modelling
- Dynamic Modelling
- Flapping Propulsion Mechanism
- Combined Forces
- Model Architecture

RESULT

CONCLUSION

REFERENCE



Aurobinda Routray

Professor

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CERTIFICATE of INTERNSHIP

TO WHOM IT MAY CONCERN

This is to certify that **Mr. Ayush Kumar** (Reg No. 21039112), B.Tech. final year student from the Department of Mechanical Engineering, "Guru Ghasidas Vishwavidyalaya" has successfully completed 6 weeks (15.05.24 to 30.06.24) as an intern under my guidance in the Department of Electrical Engineering, Indian Institute of Technology Kharagpur. He has worked on the "**Kinematic and Dynamic Model of 6 DOF Biomimetic Autonomous Underwater Vehicle**". During the period of his internship programme he was found to be punctual, hardworking and inquisitive. I wish him every success in life.

Date: 25th June 2024

Aurobinda Routray