

VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
"Jnana Sangama" Belagavi – 590 010



PROJECT REPORT ON  
“AUTONOMOUS JETBOT EXPLORER”

Submitted in partial fulfillment of the requirements for the award of degree  
BACHELOR OF ENGINEERING IN  
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Submitted By

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Under the Guidance of  
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**ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY**

(Unit of Alva's Education Foundation (R), Moodbidri)  
Affiliated to Visvesvaraya Technological University, Belagavi &  
Approved by AICTE, New Delhi. Recognized by Government of Karnataka.

**Accredited by NAAC with A+ Grade**  
Shobhavana Campus, MIJAR-574225, Moodbidri, D.K., Karnataka  
2023-2024

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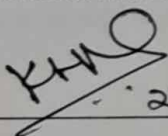
## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

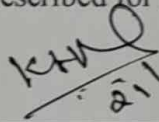
### CERTIFICATE


Certified that the project work entitled "**AUTONOMOUS JETBOT EXPLORER**" is a bona fide work carried out by

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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023-2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.


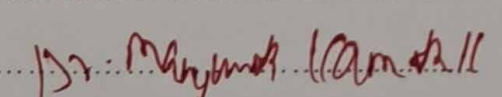
  
Signature of the Guide  
Prof. Harish Kunder

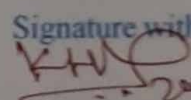
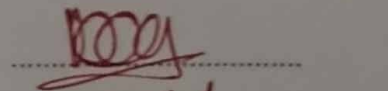
  
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### EXTERNAL VIVA

Name of the Examiners

1.   
2. 

Signature with date  
  
  
29/11/24

# ABSTRACT

The Autonomous JetBot Explorer investigates mobile robot navigation through a groundbreaking approach that merges real-world hardware with the controlled environment of simulation-based reinforcement learning. A JetBot with a camera acts as the actual obstacle avoidance platform. The navigation system's brain is a reinforcement learning algorithm called Proximal Policy Optimization (PPO). The JetBot is exposed to photos of both clear and blocked paths as part of a pre-training technique that teaches it how to avoid obstacles and find its way around them. This gives the JetBot the ability to navigate across regions that are blocked or clear. The pre-trained JetBot receives additional training in a simulated environment where PPO is used to improve its decision-making through a reward-penalty system dependent on successful navigation or crashes. At last, the whole understanding is applied to the actual world. In order to navigate a physical area and avoid obstacles in real-time, the JetBot makes use of its camera and trained model. This combination method has promise for the creation of autonomous robots capable of navigating dynamic environments, as it provides a potent way to train robots to adapt to unexpected conditions.