Indian Institute of Technology Kanpur

Department of Computer Science and Engineering

Uttar Pradesh 208016, India

Date: August 4, 2023

CERTIFICATE OF INTERNSHIP

This is to certify that **Manveer Singh** has successfully completed an internship under my guidance from 25th May 2023 to 2nd August 2023. During the internship period, Manveer Singh worked diligently and enthusiastically on *the implementation of Reinforcement Learning (RL) techniques for point-to-point navigation using ROS*.

Internship Responsibilities and Achievements:
- Conducted an in-depth literature review to gain insights into the RL algorithms and their applications in autonomous navigation.
- Developed and implemented an RL algorithm, leveraging Python and ROS, to address the challenges associated with navigation in environments.
- Conducted experimentation and analysis of the developed RL model, evaluating its performance under various scenarios and real-world using ROS and Gazebo.

Throughout the internship, Manveer Singh exhibited exceptional problem-solving skills, a strong grasp of theoretical concepts, and a commitment to continuous learning. He has showcased competence in RL implementation for point-to-point navigation, making a contribution to ongoing research.

I wish Manveer Singh all the best in their future endeavours and hope he excels in his academic and professional pursuits.

Sincerely,

Indranil Saha

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