



Prof. Arpita Sinha  
Systems and Control Engineering  
Indian Institute of Technology, Bombay  
Powai, Mumbai - 400 076, India

Email: arpita.sinha@iitb.ac.in  
Phone: (+91-22) 25787899

September 20, 2023

**To Whom It May Concern:**

I offer my support for Mr. Prachit Guptas candidature for the MITACS Globalink Summer Research Internship Program. Prachit stands as a dedicated third-year undergraduate student in the Mechanical Engineering Department at IIT Bombay. He worked with me this summer on the motion planning of autonomous cars. During this time, Prachit has been actively engaged in research focused on verifying the safety of planned motions for autonomous vehicles and developing optimized emergency trajectories in the event of safety concerns.

Prachit successfully implemented a research paper on the generation of failsafe trajectories for autonomous on-road vehicles, optimized for passenger comfort. He used CVXPY packages for convex optimization in Python and crafted Python scripts for the identification of critical points after which an emergency situation is triggered using set-based-reachability. His proficiency in Python and object-oriented programming was evident as he organized his entire code framework using multiple classes, making the code more comprehensible but also highly adaptable. Currently, he is extending the work in collaboration with another student in my group and integrating his code for the identification of the safe part of a trajectory with an existing framework of model predictive controller-based motion plan. The work is progressing steadily towards a robust motion plan optimized for various road-critical situations and validating the results in the CARLA simulation platform.

Over the course of more than three months, during which he has been working under my guidance, I observed that he distinguished himself as a self-motivated, ambitious, and diligent student. He showcased remarkable capabilities to understand, implement, and extend a research article. I can substantiate that he is a disciplined and responsible student with a cheerful personality who consistently displayed exemplary communication skills and a boundless enthusiasm for pioneering research approaches.

His affection towards research and his eagerness to learn, along with his technical background, makes him an ideal candidate. Therefore, I enthusiastically support his application, firmly believing that his competence, when paired with your guidance, will significantly enhance your ongoing research activities and provide him a truly enriching experience. If you have any questions about this recommendation, please do not hesitate to contact me, for I will gladly try to help.

Yours sincerely,

Prof. Arpita Sinha