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Kharagpur, West Bengal, India



### **Letter of Recommendation for Mr. Kshitij Anand**

I have the pleasure of writing this letter of recommendation in support of Mr. Kshitij Anand's Ph.D. study application for the Joint Doctoral Program at the Indian Institute of Technology Kharagpur and the University of Manchester. Kshitij has been known to me for more than four years. I find him a quick learner, a sincere, bright, and enthusiastic student who has strong inclination towards UAV/MAV design and control. He attended some of my courses on aerodynamics like 1. Introduction to Aerodynamics, 2. Aerodynamics Laboratory and 3. Physics of Fluid Flow Experiments as a part of his Dual Degree requirement in the Department of Aerospace Engineering, Indian Institute of Technology (IIT) Kharagpur, India. He has secured the highest grades (10/10) in all my courses. He has performed equally well in other courses and currently holds the top rank (CGPA=9.40/10.0) among sixty students of his batch. Besides, he has been attached to my research group for the last three years. Under my supervision, he has completed several research projects on aerodynamics, including (i) Investigation of rotational effects on flapping wings, (ii) Dynamic modelling of a 3DOF FWMAV, and is currently working on (iii) A Systematic study of unsteady aerodynamics in tandem flapping wings subject to a novel kinematic profile. His research findings are published in various international journals and conferences. Moreover, due to his excellent research performance, he was invited to conduct his first summer research internship at the University of Calgary, Canada and worked on the internal structure design and path planning of a transitional UAV. The following year, he completed his research internship at the Technical University of Munich expanding his horizons to the interdisciplinary research on aerodynamics and control theory. He has received the prestigious MITACS Globalink Research Award 2021 and DAAD WISE 2022 supporting his internship studies.

Kshitij has a keen interest in performing advanced research activities. I have supervised more than 20 candidates at his level and I am pleased to say that he has done exceptionally well relative to them. He possesses the capability to identify relevant research gaps and has learnt to maintain and organize the information he gains from literature reviews. Over the course of the last three years, I have seen him develop his skills in executing CFD simulations in various software such as ANSYS Fluent and OpenFOAM using advanced meshing techniques, building animated mechanical models for robotic prototypes in SolidWorks and writing programs for automation or robotic simulations in Python and C++. I would boldly suggest that Kshitij is an ardent believer in the pedagogical philosophy of "Learning by Doing!"

His work with my team has demonstrated his ability to understand the concepts and dedication to carry out the research activities for the project's timely completion. He is a well-disciplined, sincere, diligent student with a pleasant personality at a personal level. He has proven that he has the intellect, perseverance, and initiative required to pursue research in the field of robotics focused on bio-inspired mimicry.

I strongly recommend considering his Ph.D. study application at your university. I am confident that he will be highly productive in bringing out an excellent Ph.D. dissertation.

I wish him the very best in his future endeavour. If you require more information about Kshitij, you may please write to me at [smdash@aero.iitkgp.ac.in](mailto:smdash@aero.iitkgp.ac.in).

With regards,

**Sunil Manohar Dash, Ph.D.**

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