Kshitij Goel

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Current Position

Ph.D. Student, *Robotics Institute, Carnegie Mellon University*, Pittsburgh, PA, USA 2019 – Present

Education

Ph.D. in Robotics, *Carnegie Mellon University (CMU)* 2019 – 2024 (expected)
Advisors: Wennie Tabib, Nathan Michael

M.S. in Robotics (Research), *Carnegie Mellon University (CMU)* 2019 – 2021
Thesis: *Rapid Subsurface Exploration with Multiple Aerial Robots*
Advisor: Nathan Michael

B.Tech. in Aerospace Engg. (Honors), *Indian Institute of Technology (IIT) Kharagpur* 2013 – 2017
Thesis: *Reconfigurable Control for Damaged Fighter Aircraft*
Advisor: Manoranjan Sinha
Nominated for the Best Undergraduate Thesis Award in Aerospace Engineering.

Previous Positions

Research Assistant, *CMU* (with Nathan Michael on scalable multi-robot exploration) 2017 – 2019
Robotics Institute Summer Scholar, *CMU* (with Nathan Michael on various aerial robotics problems) 2017
Research Intern, *CMU* (with Nathan Michael on VR for aerial robot tele-operation) 2016
Research Intern, *IIT Kanpur* (with Abhishek on compound helicopter aerodynamics) 2015
Research Assistant, *IIT Kharagpur* (with Manoranjan Sinha on fighter aircraft control) 2015 – 2017

Honors & Awards

National Science Foundation (NSF) Ph.D. Student Travel Award 2021
To attend the ISER conference and participate in the Doctoral Consortium.
FICCI Fellow, Robotics Institute Summer Scholars (RISS) program 2017
Amongst 5 out of 800 candidates.
Boeing-IIT Kharagpur University Relations Fellow 2015 – 2017
For best all-round performance in Aerospace Engineering, IIT Kharagpur. Amongst 2 out of 50 candidates.

Publications [Google Scholar; 100+ citations, h-index: 5+]

Peer-reviewed lead-author publications are highlighted.

2022

1. *Hierarchical Collision Avoidance for Adaptive-Speed Multirotor Tele-operation*
   Kshitij Goel, Yves Georgy Daoud, Nathan Michael, and Wennie Tabib
   IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR) 2022 (Under Review)

2. *Collaborative Human-Robot Exploration via Implicit Coordination*
   Yves Georgy Daoud, **Kshitij Goel**, Nathan Michael, and Wennie Tabib
   IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR) 2022 (Under Review)

2021

3. *Fast Exploration Using Multirotors: Analysis, Planning, and Experimentation*
Kshitij Goel, Micah Corah, Curtis Boirum, and Nathan Michael
Field and Service Robotics (FSR) 2021

4. *Rapid and High-Fidelity Subsurface Exploration with Multiple Aerial Robots*
Kshitij Goel, Wennie Tabib, and Nathan Michael
International Symposium on Experimental Robotics (ISER) 2021

5. *Autonomous Cave Surveying With an Aerial Robot*
Wennie Tabib, **Kshitij Goel**, John Yao, Curtis Boirum, and Nathan Michael
IEEE Transactions on Robotics (TRO) 2021

2020

6. *Fast and Agile Vision-Based Flight with Teleoperation and Collision Avoidance on a Multirotor*
Alex Spitzer, Xuning Yang, John Yao, Aditya Dhawale, **Kshitij Goel**, Mosam Dabhi, Matt Collins, Curtis Boirum, and Nathan Michael
International Symposium on Experimental Robotics (ISER) 2020

2019

7. *Communication-Efficient Planning and Mapping for Multi-Robot Exploration in Large Environments*
Micah Corah, Cormac O'Meadhra, **Kshitij Goel**, and Nathan Michael
IEEE Robotics and Automation Letters (RAL) 2019

8. *Real-Time Information-Theoretic Exploration with Gaussian Mixture Model Maps*
Wennie Tabib, **Kshitij Goel**, John Yao, Mosam Dabhi, Curtis Boirum, and Nathan Michael
Robotics: Science and Systems (RSS) 2019

Invited Talks

1. *Fast Exploration using Multirotors*, Robotics Institute Summer Scholars (RISS) 2020

Teaching

Statistical Techniques in Robotics (CMU 16-831), TA — Spring 2022
Computer Vision (CMU 16-720), TA — Fall 2022

Mentoring

Yves Georgy Daoud (MS student at the Robotics Institute, CMU) — 2021 – Present

Professional Activities

CMU RISS Admissions Committee — 2018

Reviewing

IEEE Transactions on Robotics (TRO)
IEEE Robotics and Automation Letters (RAL)
IEEE International Conference on Robotics and Automation (ICRA)

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
Field and Service Robotics (FSR)
International Symposium on Robotics Research (ISRR)
International Symposium on Experimental Robotics (ISER)

Technical Skills

Programming	C, C++, Python
3D Animation	Blender
Exposition	Affinity Designer, Affinity Photo, Final Cut Pro, LaTeX