

Ramchander Bhaskara

PHD STUDENT · AEROSPACE ENGINEERING

Texas A&M University, College Station, TX 77843

✉ bhaskara@tamu.edu | 🏠 ram-bhaskara.github.io | 📺 ram-chander | 🎓 bhaskara

Education

Texas A&M University

PHD IN AEROSPACE ENGINEERING

- Focus: Navigation filters, hardware/software codesign, computer vision & graphics
- Advisor: Dr. Manoranjan Majji

College Station, TX

Jun 2021 - present

Texas A&M University

MS IN AEROSPACE ENGINEERING

- Thesis: Hardware implementation of navigation filters for automation of dynamical systems
- Advisors: Drs. Manoranjan Majji & Robert Skelton

College Station, TX

Aug 2019 - May 2021

National Institute of Technology

BTECH IN INSTRUMENTATION AND CONTROL ENGINEERING

- Thesis: Physics-based modeling of selective catalytic reduction system
- Advisor: Dr. Umapathy Mangalanathan

Trichy, India

Aug 2013 - Apr 2017

Professional Experience

- Jun 2023 - Aug 2023 **Visiting Student Research Intern (JVS RP)**, Robotics, Jet Propulsion Lab, Caltech
Perception for sampling autonomy of Europa/Enceladus Lander. Empirically-valid sampling site rendering and multi-sensor modeling for passive and active machine vision.
- Jun 2022 - Aug 2022 **Student Researcher**, Robotics, Jet Propulsion Lab, Caltech
Velocity benchmarking, IMU noise cancellation, RADAR odometry for vehicle velocity state estimation.
- Sept 2019 - Aug 2024 **Graduate Research Assistant**, Land, Air, and Space Robotics Lab, Texas A&M University
Research on computer vision, graphics, FPGA embedded solutions for sensing and navigation.
- Jun 2017 - Jun 2019 **Associate of Intellectual Property**, iRunway India
Patent analyst as a subject matter specialist on computer architecture and 5G infrastructure.

Publications

PUBLISHED

- Ramchander Bhaskara**, Roshan T Eapen, and Manoranjan Majji. 2023. Differentiable Rendering for Pose Estimation in Proximity Operations. (**Finalist, graduate student papers**) AIAA Scitech Forum.
- Ramchander Bhaskara**, Kookjin Sung, and Manoranjan Majji. 2022. An FPGA framework for Interferometric Vision-Based Navigation (iVisNav). 41st Digital Avionics and Systems Conference. (**Best student research paper**).
- Ramchander Bhaskara**, and Manoranjan Majji. 2022. FPGA Hardware Acceleration for Feature-Based Relative Navigation Applications. 2022 AAS/AIAA Astrodynamics Specialist Conference.
- Andrew Verras, Roshan T Eapen, Andrew Simon, Manoranjan Majji, **Ramchander Bhaskara**, Carolina I Restrepo, and Ronney Lovelace. 2021. Vision and Inertial Sensor Fusion for Terrain Relative Navigation. AIAA 2021 Scitech Forum.
- Kookjin Sung, **Ramchander Bhaskara**, and Manoranjan Majji. 2020. Interferometric Vision-Based Navigation Sensor for Autonomous Proximity Operation. 39th Digital Avionics and Systems Conference.

IN REVIEW

- Ramchander Bhaskara**, Roshan T Eapen, and Manoranjan Majji. NaRPA: Navigation and Rendering Pipeline for Astronautics.

Ramchander Bhaskara, David van Wijk, Roshan T Eapen, Davis Adams, Caleb Peck, and Manoranjan Majji. Development and Validation of Velocimeter Lidar Simulator. *To be presented at 2024 AAS GNC Conference.*

Ramchander Bhaskara, G Georgakis, J Nash, J Bowkett, M Cameron, A Ansar, P backes, and M Majji. Icy Moon Surface Simulation and Stereo Depth Estimation for Sampling Autonomy. *To be presented at 2024 IEEE Aerospace Conference.*

IN PREP

Ramchander Bhaskara, Patrick Kelly, Manoranjan Majji, and Felipe Guzman. FPGA architecture for high-speed estimation from inertial sensors.

Awards, Fellowships, Grants & Committees

- 2024 **Member of AIAA technical committee**, Sensor Systems and Information Fusion
- 2023 **Graduate Mentoring Academy Fellow**, Texas A& University
- 2023 **Finalist, GNC Conference Graduate student papers**, SciTech Forum 2023
- 2023, 22, 21 **Graduate Excellence Fellowship**, Dept. of Aerospace Engineering, Texas A&M University
- 2024, 23 **Travel Award**, Dept. of Aerospace Engineering, Texas A&M University
- 2022 **2nd place, Best student research papers**, Digital Avionics Systems Conference (DASC)
- 2022 **ASIE Scholarship**, American Society of Indian Engineers and Architects, Houston
- 2022 **Travel Award**, Office of Graduate and Professional Studies, Texas A&M University
- 2021 **NASA TechLeap Prize Winners, Control lead for autonomous sub-orbital plume tracking experiment**, NASA Flight Opportunities Program
- 2016 **IIT Madras Summer Research Fellowship**, Dept. of Aerospace Engineering, IIT Madras
- 2015 - 17 **RECT Silver 72 Scholarship**, National Institute of Technology, Trichy
- 2011 **State rank 9**, Board of Secondary Education, Andhra Pradesh, India
- 2010 **Silver medal**, National Level Science Talent Search Examination (NSTSE), India

Presentations

Ramchander Rao Bhaskara. 2023. Scratching the Surface of Europa and Enceladus. Jet Propulsion Laboratory, Caltech.

Ramchander Rao Bhaskara. 2023. Study of Topology of Icy Moons. Jet Propulsion Laboratory, Caltech.

Ramchander Rao Bhaskara. 2022. FPGA hardware acceleration for interferometric-vision based navigation. Poster at DASC Conference, Virginia.

Ramchander Rao Bhaskara, Roshan T Eapen, and Manoranjan Majji. 2022. Texas A&M ScORE: Space Object Rendering Engine. Pathways Research Symposium, Texas A&M University.

Ramchander Rao Bhaskara, Roshan T Eapen, Andrew Verras and Manoranjan Majji. 2021. Texas A&M ScORE: Space Object Rendering Engine. Lunar Surface Innovation Consortium, Applied Physics Laboratory, John Hopkins University.

Teaching Experience

Spring'24 **AERO 423: Orbital Mechanics**, Teaching Assistant

Fall'23 **Digital Signal Processing**, Seminar lecture

Outreach & Professional Development

2023-24 **Aerospace Engineering Graduate Student Association**, Professional Development Chair

2020-23 **Texas A&M University Science Festival**, Volunteer

2017 - 2019 **Bhumi (NGO)**, Volunteer Teacher of Physics

Bangalore