Ramchander Rao Bhaskara

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Academic Appointments

Dartmouth College Dec 2025 – present
Department of Computer Science
Postdoctoral Associate | Advised by Prof. Adithya Pediredla

Texas A&M University Sep – Dec 2025
Department of Aerospace Engineering
Research Engineer

Education

Texas A&M University 2021 – 2025
PhD in Aerospace Engineering | *Advised by Prof. Manoranjan Majji*

Texas A&M University 2019 – 2021
M.S. in Aerospace Engineering | *Advised by Prof. Manoranjan Majji*

National Institute of Technology, Trichy 2013 – 2017
BTech in Instrumentation and Control Engineering

Awards

Future Leaders in Aerospace Symposium 2026
Smead Aerospace Engineering Sciences, CU Boulder | *Invited participant*

Best Talk Award 2026
Postdoctoral Research Day, Dartmouth College and University of New Hampshire

Excellent Reviewer 2025
Journal of Guidance, Control, and Dynamics (JGCD)

Guidance, Navigation, and Control (GNC) Graduate Award 2024
American Institute of Aeronautics and Astronautics | *3,500 USD*

Graduate Excellence Fellowship 2020 – 2024
Texas A&M University | *5 × 1,000 USD*

Travel Award 2023 – 2024
Department of Aerospace Engineering, Texas A&M University | *2 × 500 USD*

Finalist, GNC Graduate Student Paper Award 2023
AIAA SciTech Forum | *500 USD*

Best Student Research Paper Award 2022
Digital Avionics Systems Conference (DASC) | *500 USD*

Travel Grant 2022
Office of Graduate and Professional Studies, Texas A&M University | *500 USD*

ASIE Scholarship 2022
American Society of Indian Engineers and Architects, Houston | *1,000 USD*

NASA TechLeap Prize — GNC Lead 2021
NASA Flight Opportunities Program | *100,000 USD towards flight experiment*

RECT Silver 72 Scholarship 2015 – 2017
National Institute of Technology, Trichy | *15,000 INR per year*

IIT Madras Summer Research Fellowship 2016
Department of Aerospace Engineering, IIT Madras | *Granted but declined*

Other Research Experience

Cornell University 2025
Mechanical and Aerospace Engineering | *SmallSat Mission Design School*

NASA Jet Propulsion Laboratory 2022, 2023
Mobility and Robotic Systems Section | *Research Intern*

iRunway India (now UnitedLex) 2017 – 2019
Intellectual Property | *Associate (5G/LTE network architecture)*

Publications

SDR-ToF: Million Optical Depth Samples per Second Using Software-Defined Radio
Ramchander Rao Bhaskara*, Dhawal Sirikonda*, Omkar Vengurlekar*, Juhyeon Kim, Joseph Lazarro, Suren Jayasuriya, Adithya Pediredla
ACM Transactions on Graphics (SIGGRAPH Asia), 2026

ShutterEvents: Shutter Modulation for Static-Dynamic Scene Recovery
Nevindu Batagoda*, **Ramchander Rao Bhaskara***, Christian Metzler, Adithya Pediredla
IEEE International Conference on Computational Photography (ICCP) 2026

Development and Validation of Velocimeter Lidar Simulator
Ramchander Rao Bhaskara, Roshan T. Eapen, and Manoranjan Majji
AIAA SciTech 2025

Quantized State Estimation for Linear Dynamical Systems
Ramchander Rao Bhaskara, Manoranjan Majji, and Felipe Guzmán
Sensors 2024

Icy Moon Surface Simulation and Stereo Depth Estimation for Sampling Autonomy
Ramchander Rao Bhaskara, G Georgakis, J Nash, J Bowkett, M Cameron, A Ansar, P Backes, and M Majji
IEEE Aerospace Conference 2024

Differentiable Rendering for Pose Estimation in Proximity Operations
Ramchander Rao Bhaskara, Roshan T. Eapen, and Manoranjan Majji
AIAA SciTech Forum 2023 | *Finalist, GNC graduate student papers*

An FPGA Framework for Interferometric Vision-Based Navigation (iVisNav)
Ramchander Rao Bhaskara, Kookjin Sung, and Manoranjan Majji
41^{st} *Digital Avionics and Systems Conference 2022* | *Best student research paper*

FPGA Hardware Acceleration for Feature-Based Relative Navigation Applications
Ramchander Rao Bhaskara and Manoranjan Majji
AAS/AIAA Astrodynamics Specialist Conference 2022

Vision and Inertial Sensor Fusion for Terrain Relative Navigation
A. Verras, R. Eapen, A Simon, M Majji, **Ramchander Rao Bhaskara**, C. Restrepo, and R. Lovelace
AIAA SciTech Forum 2021

Interferometric Vision-Based Navigation Sensor for Autonomous Proximity Operation
Kookjin Sung, **Ramchander Rao Bhaskara**, and Manoranjan Majji
39^{th} *Digital Avionics and Systems Conference 2020*

Under Review

On the Low-Pass Filter Design for Digital Phasemeter

Ramchander Rao Bhaskara and Manoranjan Majji

Submitted to IEEE Transactions on Instrumentation and Measurement 2026

Patents

MHz-Rate Optical Depth Imaging Using Software-Defined Radios

Adithya Pediredla, **Ramchander Rao Bhaskara**, Dhawal Sirikonda, Omkar Vengurlekar, Juhyeon Kim, Joseph Lazzaro, Suren Jayasuriya

U.S. Patent Application No.: 64/113,861

Other Publications

Real-Time Signal Processing and State Estimation for Spaceflight Applications

Ramchander Rao Bhaskara

PhD Dissertation, supervised by Prof. Manoranjan Majji

Hardware Implementation of Navigation Filters for Automation of Dynamical Systems

Ramchander Rao Bhaskara

Master's Thesis, supervised by Prof. Manoranjan Majji

Searching for Ariel's Aliens with the CRISPI Mass Spectrometer SmallSat Flyby Mission

Zach Ulibarri, S Jamal, A Alex, L Arzoumanian, **Ramchander Rao Bhaskara**, A Chadwick, S Gayen et al.

American Geophysical Union 2025

Precision Depth Sensing: Space Science to Robotics

Ramchander Rao Bhaskara

Guarini Poster Session, Dartmouth College, 2026

Toward Development and Validation of Velocimeter LiDAR Simulator

Ramchander Rao Bhaskara and Manoranjan Majji

2024 AAS Guidance, Navigation and Control Conference., Breckenridge, Colorado

NaRPA: Navigation and Rendering Pipeline for Astronautics

Ramchander Rao Bhaskara*, Roshan T. Eapen*, and Manoranjan Majji

Poster, Lunar Surface Innovation Consortium 2021

Physics-Based Modeling of Selective Catalytic Reduction System and Reduced Order Dynamics

Ramchander Rao Bhaskara

Undergraduate Thesis, supervised by Prof. Umapathy Mangalanathan, NIT Trichy

Talks

Precision depth sensing: space science and robotics

Future Leaders in Aerospace Symposium | *Invited talk* — University of Colorado Boulder | *2026*

Postdoctoral Research Day — Dartmouth College | *2026*

On-Board Sensing and State Estimation for Opto-Mechanical Inertial Sensors

Starlink (SpaceX) | *hosted by Javier Vicens (GNC)* — Seattle | *2025*

Computer Vision for Icy-World Exploration

Machine-Ground Interaction Consortium (MaGIC) | *hosted by Prof. Dan Negrut* — UW Madison | *2025*

On Sensor Simulations for Planetary Exploration

Visual Computing Seminar | *Invited Talk* — Dartmouth College | *2025*

Sampling Autonomy for Europa Lander

Jet Propulsion Laboratory | *Intern Talk* Pasadena, CA | *2023*

Study of Topology of Icy Moons

Jet Propulsion Laboratory | *Intern Talk* Pasadena, CA | *2023*

Texas A&M ScORE: Space Object Rendering Engine

Lunar Surface Innovation Consortium | *Symposium* Johns Hopkins University | *2021*

Academic Service

International Conference on Computational Photography (ICCP) *2027*
Website chair

American Institute of Aeronautics and Astronautics (AIAA) *2024 – Present*
Sensor Systems and Information Fusion (SSIF) | *Technical Committee*

AIAA SciTech Forum *2025*
Guidance, Navigation, and Control (GNC-44) | *Session Chair*

AIAA SciTech Forum *2025*
Sensor and Algorithm Analysis (SEN-02) | *Session Chair*

Hosted colloquium talks: Georgios Georgakis (JPL, 2026), Jimin Wu (Rice University, 2026)
Hosted lab visits/demos: Whitney Mason (DARPA), Laura Waller (UC Berkeley), Praneeth Chakravarthula (UNC), Xia Zhou (Columbia University), Daphna Weinshall (Hebrew University); Anthony Rizzo, Bryce Ferguson, Alberto Quattrini Li, Jonathan Chipman (Dartmouth); Andrew Morgan (RAI Institute), Dartmouth Class of 1962 (alumni).
Demos at ICCP 2026, Texas Regional Robotics Symposium - 2023, 24.

Reviews

Journal of Astronautical Sciences (JAS) (3)	2024 – 26
IEEE Transactions on Computational Imaging (1)	2026
Journal of Guidance, Control, and Dynamics (JGCD) (1)	2025
IEEE Control Systems Letters (1)	2025
American Control Conference (4)	2022 – 25
AIAA SciTech Forum (8)	2025 – 26
Transactions on Computers (1)	2023

Teaching

AERO 423: Orbital Mechanics *2024, 2025*
Texas A&M University | *Teaching Assistant*
Student feedback: "Your support and guidance during the courses have been incredibly helpful, and I truly appreciate you cheering me on as I prepare for my defense. It means a lot to have mentors like you."

Digital Signal Processing *2023*
Texas A&M University | *Department Tutorial Lecture*

Mentoring

Ankit Burudgunte *2026*
Rice University | *Undergraduate research (NSF REU), optical backscatter communication*

Dhawal Sirikonda *2026*
Dartmouth College | *PhD project, digital signal processing*

Nevindu Batagoda *2026*
Dartmouth College | *PhD project, event sensors*

Peiran Li *2026*
Dartmouth College | *MS research, optics*

Omkar Vengurlekar *2026*
Arizona State University | *PhD project, audio signal processing*

Team Lunatyx *2025*
PI for Lunar Autonomy Challenge 2025 | *2 graduate and 3 undergraduate students, visual navigation on Moon*

Omar Mohmand & Marco Peredo *2024*
Texas A&M University | *Undergraduate research: Trajectory design for Mars/Europa rendezvous*

Volunteering

Dartmouth College *2026*
Annual Science Day | *Demonstrations to K-12 students*

Montshire Museum of Science - Vermont *2026*
Astronomy Day | *Speaker, Astronomer in the House*

Texas A&M University *2023 – 2025*
Aerospace Engineering Graduate Student Association (AEGSA) | *Professional development chair*

Texas A&M University *2022 – 2025*
Science and Astronomy Festival | *Volunteer, outreach demonstrations*

Bhumi NGO *2017 – 2019*
Renuka High School, Bangalore | *Volunteering physics teacher*

Software

GUISS: Graphical Utility for Icy Moon Surface Simulations 2024