

Kruti Rajnikant Bhingradiya

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Education

University of Maryland

Ph.D. Aerospace Engineering 2024-

University of Maryland

B.S. Aerospace Engineering 2020-2024
Minor Robotics and Autonomous systems

GPA: 3.7

Dean's List: Fall '20-23, Spring '21-23

Technical Skills

Python, ROS 1-2, MATLAB, PCB Design and Fabrication (KiCad, Eagle), 3D Design Software (SolidWorks, Siemens-NX), 3D Slicing and Configuration Software, CAM, C++, Microsoft Office, Electronics design, Communication Design, Systems Design

Technical Experience

Collective Dynamics and Controls Lab *Undergraduate Researcher* University of Maryland June '21- May '24

- Designing, developing, and fabricating fish robots with baseline model of a Joukowski foil to model hydrodynamics stabilization.
- Implementing control laws based on visions and pressure sensing to sync the flapping of multi-agent robotic system in water tunnel at high frequency flapping.
- Developed testbed for feedback control law experiments on high speed water tunnel and wrote baseline software for data collection
- Prototyped soft robotic actuators using multi material printing i.e., Polyjet Fusion, FDM and SLA to alternate for injection molding
- Worked on and drove underwater ROV to assist graduate student obtain experimental data about transmission of laser signal from ROV to quadcopter.

Quantum Space *Chief Engineer (Intern Project)* Rockville, MD May '23- August '23

- Led a team of interns for design and development of a 2U CubeSat and two 0.5U CubeSats to conduct MSI (Multi-Spectral Imaging) on a 3-axis stabilized platform and establish communications with the GS (Ground Station) to relay data in real time at vertical range of ~88kft and slant range of 105kft in near space environment.
- Performed trade studies to identify frequencies for long range and short-range communications and bandpass filters for MSI
- Identified and documented Mission Success Criteria and hierarchical subsystems requirements for all individual subsystems to comply with.
- Configured flight computer to integrate sensor stack and actuators within flight software and to enable duplex communication of telemetry data stream.
- Wrote python scripts to conduct on-board NDVI (Normalized Difference Vegetation Index) on the images captured to be downlinked to GS.

NASA Jet Propulsion Laboratory *Robotics Engineering Intern* Pasadena, CA July '22-August '22

- Developed steering system for robotic micro-swimmers for future missions for extraterrestrial ocean world exploration like Europa, Enceladus, Titan.
- Optimized actuators for steering system of micro-swimmers by creating custom models of fluid dynamics in MATLAB.
- Prototyped actuators to observe the physical effects at micro scales and tested the actuators on custom testbed by varying parameters.

Near Space Balloon Payload Program *Payload and Operations Engineer* University of Maryland June '21- May '24

- Conducting pre-launch and launch operations including inflation measurements and tracking equipment set up to launch on high altitude weather balloon and post launch tracking operations including flight trajectory prediction and telemetry.
- Writing flight software and developing avionic stack for a tow body stabilization prototype for the Venusian balloon payload in collaboration with NASA JPL.
- Developing cutdown mechanism and implementing control algorithm for a payload to vent helium in-flight to achieve reduced ascent rate and float in stratosphere.
- Successfully achieved soft landing of payloads with significantly reduced descent rate after achieving neutral buoyancy during first flight of same payload
- Developed payload to livestream video with high frequency RF communications for HD video downlink and another payload to downlink images using SSTV protocol.
- Designed and conducted workshops for Aerospace Engineering freshmen to develop high-altitude payloads.

Lawrence Livermore National Laboratory *Launch and Flight Operations Intern* Salina, KS May '22-June '22, Norman, OK Dec '21-Jan '22

- Launched weather balloons flights to float weather balloons in upper stratosphere alongside NASA DCOTSS Earth Science Mission.
- Worked with atmospheric scientists to devise flight plans based on requirement of scientific objectives to plan trajectories of weather balloons without disturbing reserved aerospace in nearby regions and fly payloads for obtaining samples of beryllium atmosphere from upper stratosphere using high altitude weather balloons.

Terrapin Works Advanced Fabrication Lab *Design and Fabrication Engineer* University of Maryland Jan '21- August '24

- Designing and fabricating custom research support equipment for researchers using various industrial and scientific grade fabrication methods.
- Trained in operating industrial and consumer grade additive manufacturing equipment including FFF, FDM, PolyJet Fusion, MJF, SLA and SLS 3D printers.
- Trained in operating power tools, Waterjet and CNC machines (Datron and EZ-Router) in machine shop, PCB fabrication machines for custom electronics circuit designs.

Active Licenses, Activities, Affiliations and Awards

ARRL Ham Radio License

Class: General, Technician, Amateur Extra

Expires Feb 2032

UMD Department of Aerospace Engineering Chairs Award (May '23)

UMD Department of Aerospace Engineering Chairs Award (April '24)

Aviation Week Network 20 Twenties Class of 2024

AIAA Achievement Award (April '24)

AIAA Diversity Scholar '23

UMD Near Space Balloon Payload Program, *SGA President*

Hari Om Foundation Growing Scientist Award (March '23)

Sigma Gamma Tau Aerospace Engineering Honors Society, *Vice-President*

AEROS Scholar (June '22)

Women in Engineering, *Peer Mentor*

Brooke Owens Fellowship Finalist (Jan '23)

Women in Aeronautics and Astronautics, *Member*

Brooke Owens Fellowship Semi-Finalist (Jan '22)

American Institute of Aeronautics and Astronautics (Student Branch), *President*