# Aditya Anikode

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## EDUCATION

**Rutgers University - School of Engineering** (New Brunswick, NJ) Graduation: January 2024
*Master of Science in Mechanical and Aerospace Engineering* **Total credits completed**: 32
***Relevant courses:*** Controls I and II, Nonlinear Controls, Drones I and Drones Control and Coordination, Advanced Manufacturing, Artificial Intelligence, Applied Mathematics, Systems Analysis, Renewable Energy

**Rutgers University - School of Engineering** (New Brunswick, NJ) Graduation: May 2022
*Bachelor of Science in Mechanical Engineering and Minor in Computer Science* **Total credits completed**: 148
Dean's List: 2019, 2020, 2021
***Relevant Courses:*** Linear and Nonlinear Control, Dynamic Systems and Controls, Mechatronics, Artificial Intelligence, Datascience, Database Management, MATLAB, Calculus 1-5, Multiphysics Simulations, Design of Mechanical Components, Design and Manufacturing, Spacecraft Mission Design

## WORK EXPERIENCE

**Berkshire Grey** Boston, MA
*Robotic Systems Engineer* *January 2024 - Present*
- Core involvement in end to end product life cycles implementation and delivery, from initial prototype to system build, to commissioning and factory acceptance testing to integrate and deploy in customer warehouses.
- Integration of software into hardware, with responsibilities including debugging software, ensuring mechanical and electrical components are devoid of errors ranging from structural stability to proper wirings following electrical diagrams.
- System commissioning of cameras, robots, and electrical cabinets, with high level knowledge and expertise of Python, ROS, PLC, and numerous other software languages (Jinja, Shell/Bash scripting, Procman, xml, yaml).
- Utilization of Kubernetes, Docker container, and VNC to control, supervise, and manage computer and system processes virtually.
- Executed calibration and validation for various cameras, including depth sensors, RGB, barcode scanners, and ensured that each equipment performs independently as well as serialization and parallel processing.

**Robotics Automation Mechatronics (RAM) Lab** Piscataway, NJ
*Graduate Research Assistant* *August 2022 - January 2024*
*Project 1: Bipedal Walker*
- Developed experimental setups for leg-ground locomotion interactions.
- Prototyped mechanical components using woodworking, laser cutting, and plastic/resin 3d printing.
- Studied effects of different foot shapes on granular terrain.

*Project 2: Aircraft Tire Testbed*
- Created a circular track experimental platform with different groove patterns to test and identify optimal conditions to prevent slip during airplane takeoff and landing in different environmental weather and conditions. Commercial airplane tire attached to a 6-DOF load cell with friction sensor implemented to measure forces and identify slip boundary conditions.
- Manufacturing and Prototyping performed using woodworking, laser cutting, and 3d printing using a variety of plastics and resins.

**Rutgers Makerspace** Piscataway, NJ
*Design Consultant and Pedagogy Facilitator* *July 2021 - December 2023*
- Teach and assist Rutgers University students, faculty and staff, as well as Professor funded research projects from design to fabrication of personal projects using various machinery, ranging from 3D printers, laser cutting, Woodshop, CNC, UV printers, Embroidery and other systems. Experienced with PCB design using Altium Designer as well as implementing electronics in structures.
- Handled monetary transactions directly with customers for processing material cost payments.

**Rutgers School of Engineering** New Brunswick, NJ
*Tutor/Mentor for Engineering Students* *January 2020 - December 2024*
- Reinforce and help students assimilate course material for Data Structures and Artificial Intelligence in Python and Java

## PROJECTS AND INVOLVEMENTS

**Bipedal Granular Walker Masters Thesis Project (Jingang Yi lab group)** *September 2022 - January 2024*
- Design and fabricate a 5 degree of freedom bipedal robot that can traverse through sand and other granular terrain.

- Simulate traversing through sand in a controlled environment using Zero Moment Point stability region and a Linear Inverted Pendulum Model with the Resistive Force Theory nonlinear dynamic model in MATLAB.
- Invoke optimal control strategies to optimize foot shape for a fixed gait.
- Actuate robot using reinforcement learning control strategies and classical control approach

**AIAA - Rutgers Rocketry Propulsion Lab,** New Brunswick, NJ *January 2021 - December 2023*

*Head of Manufacturing, Aerobody Team Lead, and Telemetry Team Member*

- Engage in design, manufacturing, and launching one and two stage rockets incorporated with L1 or L2 motors
    - Use of 3D printing, laser cutting, drilling, CNC, and additively manufactured components for aerodynamic, structural, and load bearing purposes to produce a rocket with easily reproducible parts, increased modularity, and design reinforcement
- Worked with a team to design the MONKE, a 2 stage launch platform rocket for Spaceport America 2022 Competition
    - Employed SOLIDWORKS in constructing a modular rocket in which parts can be reused for multiple flights as well as OPENROCKET to simulate launch route systems. Designed 3d printable, yet structurally strong fins and fin can brackets.
    - Combined readings of various sensors such as Gyroscopes, Altimeters, GPS, Barometers, and Temperature sensors into one singular GUI for easy perusal and monitoring while the rocket is in flight.
    - Working on dramatically improving position estimation by integrating data from various sensor readings, namely the Gyroscope, Altimeter, and GPS and combining them using a control systems approach invoking Kalman Filtering.

**Zero Gravity Drone Senior Design Project,** New Brunswick, NJ *September 2021 - May 2022*

- Successfully utilized INAV and Betaflight flight controls software and SOLIDWORKS to design, fly, and test a prototype quadcopter drone and a final hexacopter product under zero gravity conditions on Earth using an appropriate calculated flight profile.
- Equations were invoked using MATLAB and SIMULINK was applied to control PID gain. A closed loop feedback control was created where the drone would use the gyroscope and accelerometer to variably adjust motor speed via a 4 in 1 ESC to ensure the drone was level at all times.
- Employed SOLIDWORKS Simulation to simulate stresses and forces on each part to ensure its sustainability in real world applications. Applied ECALC data simulation software to select ideal components such as motors, batteries, etc for optimizing quadcopter and hexacopter efficiency and finding thrust, drag, acceleration, velocity numerical inputs for generating flight profile in MATLAB.

**Pipeline Damage Detection, Modeling, and Prediction Research Project,** New Brunswick, NJ *June 2021 - September 2022*

- Designing a Bayesian Network Artificial Intelligence model to predict fatigue life of a pipeline based on equivalent initial flaw size in the material. Accurately predicting the most crucial time loading cycle when structure may become susceptible to failure.
- Finite Element Simulations (ABAQUS and COMSOL) performed on pipe models for several cases of crack length and depth in pipe wall thickness.

**Rutgers Robotics Team,** New Brunswick, NJ

*VEX Robotics Team Member* *July 2020 - September 2022*

- Design and engineer robots using FUSION 360, AUTOCAD, and Arduinos for VEXU Robotics competition. Exposure to ROS.

## LEADERSHIP EXPERIENCE AND AWARDS

**International Conference on Robotics and Automation (ICRA) Paper Submission** *May 2024*

*Foot Shape-Dependent Resistive Force Model for Bipedal Walkers on Granular Terrains*

**Lean Six Sigma Yellow Belt Certification** *October 2020*

*Application of statistical, problem solving, and quality tools constituting significant value to the continuous improvement process*

**Institute of Electrical and Electronic Engineers** *July 2020 - December 2023*

*Public relations with general members*

**Rutgers University Student Assembly** *January 2018 - December 2019*

*Representative for the Engineering Governing Council at Rutgers University Student Assembly*

## SKILLS & INTERESTS

**Technical Skills:** Linux, ROS, PLC, Kubernetes, Docker Container, Electrical drawings and wiring, SOLIDWORKS, SIMULINK, Java, Python, MATLAB, COMSOL, ANSYS, OpenRocket, RockSim, ECALC, INAV, Working with Arduinos and Raspberry Pis, CNC, Woodshop, Laser Cutting, Microsoft Office, 3D-Printing, UV printing, Vinyl and Mat cutting

**Soft Skills:** Timeline planning, Resource Allocation and Budgeting, Leadership, Adaptability, Communication, Patience, Conflict management, Time management, Public Speaking, Team Player, Puzzle and Problem Solving