Rishab Rijal

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Education

The University of Texas at Arlington

- Master of Science in Mechanical Engineering — Expected Graduation: May 2024
- Bachelor of Science in Mechanical Engineering — August 2018 – May 2022
  Bachelor of Science in Aerospace Engineering (Minor)
  Honors: Magna Cum Laude (GPA: 3.78)

Experience

- **Research Fellow: -Navigation, Guidance, and Control of Autonomous Vehicle lab** — **May 2022 - Current**
  - Simulate the cooperative motion of multiple unmanned aerial vehicles (UAVs) to surround and capture the intruder swarms with proper orientation using the guidance law based on the collision cone approach in MATLAB and ROS.
  - Apply the guidance law to the crazyflie drones to execute the capture mission in the laboratory.
  - Assemble the flapper drone, calibrate the sensors in the drone, and execute the manual control system of the drone.
  - Develop the autonomous control system of the flapper drone by installing a beacon marker.
- **Graduate Teaching Assistant: - The University of Texas at Arlington** — **Sep 2022 – Current**
  - Initiate and facilitate classroom discussions for Astronautics.
  - Grade students' assignments and evaluate overall class performance.
  - Hold regular office hours to assist and advise students with the course.
  - Help students with the simulation of the motion of the satellites using Astrodynamics.
- **Supplemental Instruction Leader: -The University of Texas at Arlington** — **Aug 2019 - Dec 2020**
  - Conducted the structured group session for Physics and MATLAB programming and facilitated the learning of the students.
  - Assisted students with classroom assignments and concepts in class.
  - Helped students exercise problem-solving methodologies.
- **Tutor: The University of Texas at Arlington** — **Aug 2020 – Dec 2020**
  - Conducted one-to-one tutoring sessions on Statics, Numerical Analysis, C++/C, and MATLAB Programming.
  - Assisted students with projects, test preparation, and other academic tasks.
  - Worked with students to help them understand key concepts taught in the classroom.

Research/Projects

- **Automatic Landing Autopilot** — **Jan 2022 – May 2022**
  Designed the automatic landing system for the all-weather operation of the aircraft. Simulated the landing of the aircraft down a predetermined glide slope at the pre-selected altitude, reduced the rate of descent, and caused the aircraft to "flare" out and touch down with the acceptably low rate of descent.
- **Mars Rover** — **Aug 2021 – May 2022**
  Worked as a control lead in a team of 5 students to design and successfully operate an automated rover that goes to the appropriate location, digs, and collects the soil sample, tests for the chemical components, and concludes the presence or absence of life. Designed the electrical circuit of the system and worked on the autonomous controls of the rover using Arduino.
- **Supersonic Airfoil Design** — **Aug 2021 – Dec 2021**
  Designed the supersonic airfoil and used the shock expansion theory to evaluate the aerodynamic performance of the airfoil. Developed an algorithm in MATLAB to determine the performance of the airfoil based on the dimensions provided by the user. Furthermore, observed the effect of each geometric parameter of the airfoil on the aerodynamic performance of the airfoil.
- **Determination of the Effects on Thermal Property by 3D Printing Methods** — **Aug 2020 – Dec 2020**
  Worked with Dr. Ankur Jain to carry out the transient heat transfer analysis on a new 3D printed material using ANSYS CFX that replicated the experimental result obtained in the lab. Repeated the analysis of the same material by 3D printing under different conditions (Temperature, Pressure, etc.) to analyze the effects of the 3D printing conditions on the thermal property of the material.
- **Simulation of Variable Mass System** — **May 2021 – Aug 2021**
  Formulated the equation of motion for the variable mass system and simulated its motion using MATLAB and created the animation of the motion. Furthermore, performed a work-energy analysis and verified the energy consistency of the system.
- **Computational Fluid Dynamics** — **Aug 2021 – Dec 2021**
  Worked under the supervision of Dr. Brian Dennis to analyze the human respiratory system using ANSYS fluent. Analyzed the CT scan of the human respiratory pipe, created the model for the pipe and analyzed the temperature and humidity distribution along the flow direction.

Skills

- **Technical:** ROS, Control System Design, Computational Fluid Dynamics, ANSYS Fluent, ANSYS CFX, ANSYS Mechanical
- **Programming:** C++/C, MATLAB, Simulink, Arduino, LabView
- **Design Software:** Solid Works, DesignModeler, SpaceClaim
- **Hardware:** 3D-Printing, Electronic circuit design, Soldering

Awards/Organization

- Mavericks Scholarship of $32000 for undergraduate study by The University of Texas at Arlington.
- Named to the College of Engineering Dean's List for Fall 2019, Spring 2020, Fall 2020, Spring 2021, and Spring 2022.
- Member of American Society of Mechanical Engineers.