Rishabh Goel

rishgoel98@gmail.com • + 1 (734) 882-5244

EDUCATION

GEORGIA INSTITUTE OF TECHNOLOGY PhD in Robotics

UNIVERSITY OF MICHIGAN

Atlanta, GA 2022-Present

Ann Arbor, MI Bachelor of Engineering, Major in Electrical Engineering, Major in Computer Science (Dual Degree) 2017-2021

EXPERIENCE

RESEARCH	Atlanta, GA, and Evanston, IL
Research assistant	2022-Present
 Submitted a journal article for material identification Sweepy: Acoustic spectroscopy for material id Rishabh Goel, Alexander Adams (IN REVIEW) 	using Acoustic Spectroscopy 2024 lentification
 Developed an algorithm to detect failure in soft actual techniques. In review for ICRA 2025 FAULT: Failure Analysis Using Learning Tech Rishabh Goel, Tejonidhi R Deshpande, Tingy Cheng, 	tors using Machine learning 2024 aniques for soft actuators Alexander Adams, Josiah Hester
• Presented a poster for a late-breaking abstract at Livi Failure aware and resilient control for soft ac Rishabh Goel, Tejonidhi Deshpande, Tingyu Chen, Jo	ng Machines. 2024 tuators osiah Hester
• Designed a wearable health prototyping platform and HealthHub: A Wearable Health Prototyping T Rishabh Goel, Josiah Hester, Alexander Adams	l got a paper accepted in BSN 2024 oolkit
• Created a Battery Free UAV prototype and published Exploring Batteryless UAVs by Mimicking Bir Rishabh Goel, Tien Pham, Phuc Nguyen, and Josiah Ninth Workshop on Micro Aerial Vehicle Networks, S Association for Computing Machinery, New York, NY <u>https://doi.org/10.1145/3597060.3597243</u>	a workshop paper 2023 d Flight Hester. 2023 In Proceedings of the Systems, and Applications (DroNet '23). 7, USA, 15–20.
• Designed the hardware and electronics for a battery f Protean: An Energy-Efficient and Heterogene Hardware-Accelerated Battery-Free Computing Abu Bakar, Rishabh Goel, Jasper de Winkel, Jason H Przemysław Pawełczak, Kasım Sinan Yıldırım, and Jo In Proceedings of the 20th ACM Conference on Embe	for a prototyping platform 2022 ous Platform for Adaptive and ng. (uang, Saad Ahmed, Bashima Islam, osiah Hester. 2023 edded Networked Sensor Systems

(SenSys '22). Association for Computing Machinery, New York, NY, USA, 207–221. https://doi.org/10.1145/3560905.3568561

PATENTS

• Battery Free unmanned aerial vehicles (PENDING) US20230391479A1

PROJECTS

Deep Learning Final Project

- PiezEnhance: a deep network for reconstruction high quality audio from low quality piezoelectric microphones
- Developed a deep network to reconstruct high quality audio from low quality piezoelectric microphone audio.
- Tested performance using qualitative and quantitative analysis to judge the quality of the reconstructed audio.
- Experimented with different loss functions and audio comparison techniques to enhance perfomance

Simulating Drones to monitor air pollution

- Developed a system that utilizes drones to monitor air pollution over the georgia tech campus.
- System could identify potential hotspots based on population density across campus for every hour of the day.
- Path planning algorithms determined minimum flight time across the graph to cover all areas on campus and simulations were conducted to chose the number and types of drones needed.

Race Electrical Lead - University of Michigan Solar Car Team

- Developed custom PCB to electrically connect and monitor experimental Li-ion pouch cells to build a 6kWh pack with only 20Kg of cells.
- Designed the solar array layout and wiring for the 2019 solar car, Electrum.
- Improved the Battery Management System of the car by improving the efficiency and modularity of the system.
- Planned the integration of all the electrical systems in the car with each other and with the mechanical systems.
- Designed and programmed the supplemental Battery Management System for a secondary emergency battery
- Assembled a custom designed battery pack with a maximum voltage of 172 V and discharge of 100A using 18650 cells
- Designed and manufactured a 2.0 square meter silicon cell supplemental solar array that could fold up to fit in the back of the solar car
- Analyzed different series and parallel configuration to minimize losses and increase efficiency of the MPPTs (Maximum power point trackers) for the 2019 solar car.
- Designed custom PCB and implemented communication protocols like CAN, SPI, I2C and UART for the STM32F4 and STM32L4 processors.
- Redesigned and implemented the hardware and firmware for all the existing boards in the car to work with Low power STM32L4 processors.

Autonomous Pond Cleaning Robot

- Worked in a team to create an autonomous robot that can scoop trash out of ponds.
- Developed the Kalman filtering algorithm to get accurate location by sensor fusing an IMU and GPS data.
- Designed and built the custom power and control electronics for managing the motors, microcontroller and sensors.

Atlanta, GA 2024

2023

ANN ARBOR, MI 2018-2019

2021

Whiteboard Plotter

Educational Drone Research

2019

- Modified a consumer toy drone to create a gesture drone for the final project of ENGR 151 • and got invited by the professor to do research on drones.
- Researched about the feasibility of a modular autonomous drone to be used to teach C++.

Skills & Abilities

- **Embedded Systems and Electronics** •
 - Experienced with hand soldering and reflow soldering for SMD and 0 through-hole components
 - Skilled with electronic tools like, variable CC CV power supply, network 0 analyzer, oscilloscope and multimeter.
 - Designed PCBs in Altium, Eagle and Kicad. 0
- **Programming experience**
 - Experience building and training ML models in python and MATLAB 0
 - 0 Experience creating data pipeline for preprocessing and data processing and feature extraction.
 - Proficient in C++, C, Matlab, and python 0