

Sajana Ratnayake

MS Mechanical & Aerospace Engineering

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EDUCATION

Master of Science in Mechanical Engineering
Arizona State University | December 2023

Master of Science in Aerospace Engineering
Arizona State University | May 2020

Bachelor of Science in Mechanical Engineering
Arizona State University | May 2019

SKILLS

Coding: Python, C++, MATLAB & Simulink
Computer Aided Design: SolidWorks, Fusion 360, ANSYS, Vorlax
Data Analysis: JMP Statistical Software, Microsoft Excel, Six Sigma Methodology

CERTIFICATIONS

Project Management Foundations
Core Strategies for Teaching in Higher Ed

PUBLICATIONS

Low Aspect Ratio High-Lift Wing Design for Automotive Racing Applications
<https://doi.org/10.2514/6.2023-4311>

New Approaches to Direct Wing Shape Synthesis using Potential Flow Solvers
<https://doi.org/10.2514/6.2022-0547>

An Improved Synthesis Method to Develop Conceptual Design Wing Lofts
<https://doi.org/10.2514/6.2021-0218>

RELATED COURSEWORK

Fluid Mechanics
Rocket Propulsion
Aircraft Propulsion
Design Optimization
Multi-Robot Systems
Six Sigma Methodology
Advanced Aerodynamics
Design Engineering Experiments
Applied Computational Fluid Dynamics

SUMMARY

Engineering professional with proven record in aerodynamics research, design optimization and data analysis through various projects serving as a subject matter expert. 5+ years of experience in Aerospace and Mechanical Engineering projects spanning from process automation, automated delivery systems to being a leader in instructing over 1000 engineering students at Arizona State University.

EXPERIENCE/PROJECTS

Lead Quality Engineer/CFD Analyst **PurcellAI** | England | July 2024 - Present
Ensuring ISO standards are maintained during the development of smart inhalers and medical diagnosing devices and conducting fluid dynamics studies to verify particle deposition at target areas after inhalation.

- Overlooking a team of 40 engineers to ensure that ISO standards are being maintained during the development of smart inhalers and medical devices.
- Modeling human airways using SolidWorks and analyzing airflow and particle deposition using OpenFOAM to treat asthma and COPD.

Aerodynamics Research **ASU** | Arizona | December 2019 - December 2023
Utilized potential flow solvers (VORLAX) and superposition principles to rapidly synthesize Formula 1 racecar wings and aircraft wings by automating the design process to achieve assigned lift and pressure conditions.

- Automated the analysis of thousands of data points per solution on Microsoft Excel to achieve required performance conditions.
- Conducted simulations on VORLAX and formatted results for data processing.
- Reduced the time taken for input file generation by utilizing Python bringing input file generation time to a few seconds.
- Modeled racecar wings on SolidWorks and analyzed designs on ANSYS to verify usability of the design algorithm.

Multi-Robot Systems Delivery Robot **ASU** | Arizona | August 2023 - December 2023
Developed a simulation on MATLAB for a multi-robot aerial delivery system for delivering packages from a delivery hub to customer homes.

- Specialized controllers for obstacle avoidance, speed control and tracking deliveries to ensure successful delivery.
- Generated animations of the robots to visualize the actions performed and observe the evolution of the controllers.

Graduate Teaching Assistant **ASU** | Arizona | May 2019 - December 2023
Taught classes varying between Introduction to Engineering, Engineering for Humanity, Mechanical Engineering Design and Engineering Profession to educate freshmen through seniors in college.

- Impacted over 1000 student lives to ensure student success and retention in college.
- Introduced the engineering design process while educating students on designing, prototyping, manufacturing and testing products.
- Taught students and faculty about safe use of power tools including drills, scroll saws, jigsaws and oscillating tools.
- Educated students on the use of multimeters, oscilloscopes, illuminance meters and variable power supplies.

Shark Repelling Drone **ASU** | Arizona | December 2018 - May 2019
Designed and prototyped a quadcopter capable of delivering shark repelling fluid to occupied beaches in order to prevent shark attacks on humans.

- Ensured product durability by performing hand calculations and simulations to ensure stress and fatigue did not disable the product.
- Performed FMEA analysis to minimize failure possibilities and devised recommended actions as required.
- Manufactured and machined all required components and performed system and final prototype testing to verify proof of concept.

Mechanical Technician **Mercedes-Benz** | Sri Lanka | May 2017 - July 2017
Serviced Mercedes-Benz vehicles and advised customers to ensure safe and optimal running of vehicles.

- Conducted repairs on engines, suspensions, cooling systems, exhausts and fuel supply.
- Learned to use the STAR Diagnostic System to diagnose faults and ensure optimum performance of the vehicle.
- Worked alongside a team of 5 mechanical technicians to oversee daily operations in the mechanical department.