

SAMER MARMASH

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EDUCATION

Rice University

Bachelor of Science in Mechanical Engineering, Minor in Engineering Design

Houston, TX

Expected May 2027

- **Relevant Coursework:** Matrix Analysis, Differential Equations, Multivariable Calculus, Mechanics/Statics, Stress Analysis, Rigid Body Dynamics, Classical Thermodynamics, Computational Thinking, Engineering Design

TECHNICAL SKILLS

Programming Languages: Python, MATLAB, Java, C, C++, JavaScript, Golang, LaTeX

CAD & Engineering Tools: SolidWorks, Fusion 360, OnShape, Excel, AutoCAD

Manufacturing & Prototyping: 3D Printing (FDM/SLA), CNC Machining, MIG Welding, Manual Machining, Rapid Prototyping

Hardware & Electronics: Arduino, Servo Control Systems, Sensor Integration, Circuit Design, Embedded Systems

PROFESSIONAL EXPERIENCE

Rice Wind Tunnel

Mechanical Design Engineer

Houston, TX

May 2025 – Present

- Engineered redesigned wind tunnel base structure featuring dual longitudinal steel support frames, increasing test section accessibility by 60% and reducing experimental setup reconfiguration time from 45 to 15 minutes
- Executed precision fabrication of 8 structural components using CNC mill with ± 0.005 " tolerance, performed MIG welding for frame assembly achieving 95% joint efficiency, and integrated load-bearing elements supporting 500+ lbs aerodynamic loading
- Collaborated with 4-member research team to validate structural integrity through FEA in SolidWorks, ensuring compliance with safety factors above 2.5 under maximum operational wind speeds of 120 mph

Rice Electric Vehicle

Mechanical Powertrain Specialist

Houston, TX

October 2024 – Present

- Designed and fabricated 12 custom aluminum mounting brackets for 72V battery pack system, reducing installation time by 40% while maintaining < 2 mm positional tolerance across thermal cycling
- Integrated suspension components including A-arms and coilover assemblies for fully electric vehicle chassis, coordinating mechanical and electrical subsystem interfaces across 8-person team
- Conducted stress analysis on chassis mounting points using hand calculations and SolidWorks FEA, validating safety factors > 3.0 for peak cornering loads of 1.5g lateral acceleration

ENGINEERING PROJECTS

Infant Retinal Imaging System – ROP Screening Device for Kenya | OnShape, 3D Printing, Raspberry Pi

January 2026 – Present

- Continuing development of a low-cost, portable Retinopathy of Prematurity (ROP) screening device for neonatal care in Kenya, building on prior team's prototype and full design handoff documentation
- Owned mechanical CAD for a key device component, redesigning for manufacturability and clinical usability (tool-less assembly features, improved cable routing, and smoother exterior geometry to support rapid wipe-down disinfection)
- Maintained sub-\$300 bill of materials and compact form factor (22.5 cm \times 13 cm \times 11.5 cm), enabling shipping and deployment in low-resource hospital settings

Robotic Prosthetic Hand with Haptic Feedback | Arduino, Fusion 360, C++, FSR Sensors

January 2025 – Present

- Designed and prototyped 5-finger articulated mechanism with servo motors achieving 90° range of motion per joint, integrating force-sensitive resistors at fingertips to detect 0–10N grip pressure with $\pm 5\%$ accuracy
- Programmed Arduino Uno to process real-time sensor data at 100Hz, implementing PID control algorithm mapping pressure readings to proportional vibration motor intensity (0–255 PWM) on user's forearm for haptic feedback
- Iterated through 6 design revisions in Fusion 360, optimizing finger geometry to reduce weight by 30% while maintaining structural integrity under 15N grip forces during object manipulation testing

Rocket Telemetry Tracking System – Rice Eclipse | SolidWorks, Antenna Systems, Field Operations

August 2025 – December 2025

- Engineered dual-axis gimbal tripod system for Yagi directional antenna achieving $\pm 2^\circ$ tracking precision, enabling continuous telemetry lock on rocket trajectories reaching 100,000 ft altitude and Mach 0.8 velocities
- Fabricated secondary 10-ft extension pole tripod for omni-directional antenna using aluminum tubing, designing custom hinge mechanism and performing stability testing under 2 mph wind conditions to ensure secure field deployment
- Collaborated with 3-person telemetry team to validate antenna performance through ground station testing, achieving 95% uplink reliability during launch operations

Electric Bike Performance Optimization | Carbon Fiber, 3D Printing, Mechanical Design

December 2024 – December 2025

- Designed and assembled custom electric bike integrating carbon fiber seat post and handlebars, achieving 2.3 lb (18%) weight reduction while maintaining structural rigidity for 140lb rider and 25 mph commuting speeds
- Modeled and 3D-printed ergonomic thumb throttle using TPU filament, iterating through 5 prototype versions to optimize grip comfort and control precision, resulting in 40% improved throttle response feedback
- Integrated 1000W brushless motor with 48V battery system, achieving 28-mile range and reducing daily commute time by 35% compared to traditional cycling