

SHIVAL SHAH

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DESIGN CYCLE EXPERIENCE & SKILLS

Conceptualization	FEA	Prototyping	Manufacturing	Analysis
Fusion CAD + CAM, DFM, GD&T, SolidWorks, DFA	Solidworks Simulation, Factors of Safety	FDM 3D Printing, Laser Cutting	Machining with CNC Mills / Lathes, Material Selection	RCA, Python, C, C++, Excel BOM, MATLAB

EXPERIENCE

Undergraduate Researcher | Human-to-Everything Lab 📄 Aug 2025 - Present

- Co-authoring a paper introducing a routing policy improving autonomous navigation in high uncertainty, low latency environments, by intelligently offloading ambiguous edge cases to the cloud; achieves 99% accuracy of cloud baseline with median response time < 5ms (from 5s), enabling real time deployment on constrained devices
- Modified the training pipeline to use SAC, enabling sample efficient machine learning and allowing iteration without a computationally intractable simulation
- Building the mechanical systems on an autonomous vehicle for visually impaired users, fixing misaligned mounts and integrating camera / actuation hardware to enable autonomous urban mobility using computer vision

Team Member | Formula SAE / Formula Electric Aug 2024 - Present

- Fabricated a custom radiator test bench to empirically validate flow rates and pressure differentials, identifying system inefficiencies by referencing real world data against manufacturer specifications
- Leveraged test bench data to downsize the radiator by 30%, reducing vehicle weight while maintaining the required thermal dissipation curve under load
- Designed electrical component mountings, seat geometry, and driver retention system to meet FH+E safety rules

Solo | Flashlight 📄 Feb 2026 - Mar 2026

- Designed a CNC machined aluminum flashlight from scratch spanning mechanical design, custom PCB layout, FEA, and waterproof sealing, integrating all disciplines into a single tightly constrained product
- Engineered through wall magnetic dimming using Hall Effect sensing and $1/r^3$ field calculations to determine the 25mm travel limit, eliminating mechanical penetrations to maintain a fully sealed body
- Validated structural integrity via drop impact FEA (250N, 110g shock), confirming a minimum safety factor of 2.37 at the thinnest wall section where threads reduce material to 0.2mm

Project Lead | GEEN 1400: Engineering Projects 📄 Jan 2025 - May 2025

- Engineered the electromechanical actuation system for a smart window by designing a chain drive transmission and enabling Arduino & stepper motor driven autonomous ventilation
- Validated the night flush cooling strategy by processing sensor telemetry logs in MATLAB, modeling a 50% reduction in AC load to project average annual savings of 1000+ kWh and \$200+

Department Lead | Foothill High School Engineering Nov 2022 - May 2024

- **FSAE Car:** led team of 23 to build FSAE car; incomplete by graduation, now mentoring new team
- **Tennis Ball Pickup & Feeder:** designed dual mode ball machine for automatic feeding & pickup
- **VP, 3D Modeling:** recruited to teach CAD, doubled attendance via presentation skills

Founder | JuniorAces Tennis 📄 May 2021 - Feb 2024

- Launched novel tennis academy model by integrating AI with traditional methods, enabling premium coaching at 85% lower cost than market, driving successful exit and saving customers \$1 million+ overall
- Achieved 10% churn (40% industry average) by training 8 coaches to serve 120 students across 3 locations

Project Lead | Samsung Solve for Tomorrow Oct 2022 - Jun 2023

- Led team of 6 to state finals (top 1% of 30k teams), winning \$5k for two stage erosion detection system
- Engineered holistic erosion detection pipeline; paired Bayesian CNN based drone surveys to identify risk zones with autonomous rover based soil sampling of drone identified risk zones, reducing cost of accurate verification

EDUCATION

Boston University Aug 2024 - Present

B.S. in Mechanical Engineering

Courses: Statics, Differential Equations, Probability & Statistics