MAX SONG

https://max-song-04.github.io/ | +1 (832) 660-2931 | maxsong@utexas.edu | linkedin.com/in/maxsongut

EDUCATION

The University of Texas at Austin May 2027
Bachelor of Science in Mechanical Engineering | *Design and Manufacturing Track* GPA: 3.85
Relevant Coursework: Solids, Dynamics, Materials, Fluids, Computational Methods, Statics, Thermodynamics

SKILLS

CAD/CAE: Solidworks (Assemblies, Drawings, BOM), Fusion 360 (CAM), Autodesk Inventor, Blender, Abaqus FEA, ANSYS, MS Office
Analysis: MATLAB, Python (OpenCV, Matplotlib, Pandas, NumPy), FEA (Static, Modal), GD&T, Tolerance Stacks, Structural Analysis
Prototyping: DFM/DFA, Composite Layups (Vacuum Bagging, Resin Infusion), Mechanisms (Gears, Actuators, Bearings, Fasteners)
Manufacturing: CNC Mill, Manual Mill, Manual Lathe, Laser Cutting, SLA and FDM Printing, Soldering, Injection Molding, Table Saw
Materials: Carbon Fiber, Fiberglass, Basalt Fiber, Glass beads, Al 6061-T6, PLA/PETG/TPU/ABS/PA-CF, Elastomers, PMMA

EXPERIENCE

Texas Rocket Engineering Lab; Austin, TX September 2024 – Present
Halcyon Mark 1 – Mechanical Structures Engineer; Composites Manufacturing Engineer
- Led the development of a 48-inch length nosecone in SolidWorks, utilizing DFM principles for composite fiberglass manufacturing, using a 3D printed ABS vacuum-forming mold and troubleshooting Gigabot large format FDM printer for mechanical failures
- Fabricated flight-critical components (carbon fiber skirts and couplers, fiberglass raceway mounts) using hand layups and vacuum bagging techniques for Halcyon Mark 1 (a liquid bipropellant spaceshot rocket), passing 9600 lbf axial structural validation test
- Designed and manufactured access ports integrating LOx and propellant fluid lines into rocket skirts utilizing manual cutting tools

Orbital Test Stands – Structures Engineer
- Spearheaded CAD model of 30-ft test stand structure for hot-fire engine testing with 30+ components (steel grate flooring, I-beams, brackets, anchors) in SolidWorks for Preliminary Design Review (PDR) enabling structural integration
- Conducted root-cause analysis, redesigning pressure transducer brackets with isolation improving sensor accuracy during testing
- Developed Excel ACI 318 bolt calculator achieving 150% load capacity while reducing bolt count with standard GSE safety factors

Texas Inventionworks Makerspace at the University of Texas at Austin – *Student Technician;* Austin, TX August 2024 – Present
- As woodshop lead, directed cross-functional team of 10+ student staff to develop preventive maintenance (PM) schedules, safety protocols and SOPs for 12+ machines (planer, jointer, table saw, router, bandsaw) increasing equipment uptime by over 20%
- Instructed 100+ students in hands-on curriculum covering manual mill, lathe, CNC, SLA/FDM 3D printers on machine shop team
- Led student engagement initiatives including project competitions like Pinewood Derby to improve student participation by 35%

Architected Intelligent Matter Lab at the University of Houston – *Materials Research Intern;* Houston, TX June – September 2025
- Developed layered casting method for thin-shell elastomer half-spheres using precision steel ball mold with laser-cut acrylic jig; performed modeling and layer thickness testing achieving ±0.2 mm dimensional accuracy for acoustical metamaterial testing
- Improved Abaqus FEA modal simulation accuracy by 10% using Instron ASTM D412 tensile tests and OpenCV video extensometry
- Automated material characterization workflow using Python reducing analysis time by 60% enabling rapid design iterations

Project PL-8 – *Shell Engineer Lead*; Austin, TX September – January 2025
- Led design of 7 vehicle shell panels using surface modeling in Blender for two-seat hypercar with CFD consideration, applied DFM principles including draft angles for basalt fiber composite manufacturability via vacuum-assisted resin transfer molding (VARTM)
- Coordinated cross-functional integration with chassis and powertrain teams through design reviews resolving 4 major conflicts including shell to chassis mounting interference and clearance issues using clash detection and tolerance stack analysis

PROJECTS

Custom Macropad Keyboard – *Electronics and Product Design Engineer* November 2024
- Designed complete custom assembly and PCB layout, performing component selection, circuit design, and tolerance analysis
- Manufactured prototypes through complete workflow including FDM/SLA 3D prints (PLA housing, PETG plate, resin keycaps), PCB hand soldering (switches, diodes, resistors), Python firmware programming, and electrical validation testing with multimeter

Battle Bots Design Competition – *Electronics and Weapons Engineer* October 2024
- Designed complete robot assembly featuring optimized single-tooth vertical spinner weapon with center of mass analysis and integrated electronics system including motors, ESC hand soldering, radio receiver integration, and controller configuration