
Education

Arizona State University, Tempe, AZ**Master of Science:** Aerospace Engineering

GPA – 3.37/4

Aug 2021-May 2023

SRM Institute of Science & Technology (KTR), Chennai, India**Bachelor of Science:** Aerospace Engineering

GPA – 7.56/10

Aug 2016-May 2020

Master's Thesis

Physical modeling and simulation of polymeric structures with metallic material for property enhancements

Nov 2022-May 2023

ASU, AZ

Supervisor: Prof. Cindy (Xiangjia) Li

- Investigated resin compositions and optimized curing parameters over 10 iterative cycles to enhance conductivity and material performance, particularly focusing on samples containing 0–3% PEDOT: PSS.
- Explored the feasibility of copper deposition on conductive 3D-printed films under varying voltages (50–100V), targeting applications in flexible electronics.
- Utilized COMSOL Multiphysics to simulate nine distinct designs, assessing copper deposition behavior, mechanical strength via tensile testing, and overall conductivity.
- Fabricated 400 μm structured cubic samples, conducted copper deposition, and analyzed top surface properties using Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Spectroscopy (EDS), contributing to advancements in next-generation conductive composite materials.

Projects

Thermoelectric Material Fabrication

Jan 2022-Oct 2022

- Designed and 3D-printed custom molds for Sb_2Te_3 thermoelectric material processing; improved material quality via fine mesh filtration and controlled heat pressing.
- Optimized sintering parameters and assessed thermal stability using TGA to enhance sample density and electrical conductivity.

Neural Network-Based Trajectory Optimization for Rocket Landing

Sept 2022-Oct 2022

- Formulated the rocket landing task as an optimization problem using discrete-time dynamics, where a neural network controller maps the rocket's state to control actions.
- Implemented and trained the model in PyTorch, using automatic differentiation to optimize the controller parameters by simulating rocket dynamics and minimizing the landing loss.

Design Optimization of a Brake Disk

Nov 2022-Dec 2022

- Optimized brake disc design using ANSYS simulations and multi-objective genetic algorithms (MOGA) to minimize volume, stress, and temperature while maximizing vibrational frequency.
- Developed and analyzed response surfaces using Latin Hypercube Sampling (LHS) and sensitivity analysis to identify key geometric parameters impacting thermal and structural performance.

CFD Simulation of Thermofluidic Systems Using ANSYS

Aug 2022-Dec 2022

- Conducted CFD simulations using ANSYS to analyze laminar and turbulent flows in various thermofluidic applications, including elliptical pipe flow with liquid diesel and water heater buoyancy-driven convection using the k-epsilon turbulence model.
- Investigated viscous heating effects in engine oil through spiral tube simulations under zero wall heat flux conditions, visualizing thermal gradients and flow behavior for heat-sensitive applications.

Analysis of Acoustics of Jet Flow

Jan 2019-May 2020

- Designed and tested converging-diverging nozzles (Mach 1–2.5) with a flow conditioning system; conducted experiments across NPR 1–3 to study jet acoustics under controlled inlet conditions.
- Analysed acoustic data to identify shock cell structures and screech tones; established that OASPL increases with NPR and observed over-expansion with distinct screech at Mach 2.5, NPR 3.

Aircraft design

Sept 2019-Nov 2019

- Led a multi-disciplinary aircraft design project, creating a detailed 3D model using CATIA V5 and applying core aerospace engineering principles.
- Performed simulations to optimize aerodynamics and fuel efficiency, achieving a maximum speed of Mach 1.8 and a 3–4% improvement in overall performance.

Self-Healing Materials

Feb 2019-April 2019

- Investigated self-healing epoxy composites using 3D vascular networks and microcapsules, targeting a 50% reduction in aerospace maintenance costs.

- Analyzed repair mechanisms and material performance, identifying 10% porosity reduction and optimal capsule thickness as critical factors for extending component lifespan by up to 40%.

Relevant Courses

Polymers and Composites, Modern Manufacturing, Applied Computational Fluid Dynamics, Design Optimization, Probabilistic Methods for Engineering, Vibrations and Elements of Aeroelasticity, Applied Structural Mechanics, Solid State Devices and Circuits, Advanced Solid Mechanics, Applied Fluid Mechanics, Applied Engineering Mechanics, Basic Electrical Engineering, Numerical Methods

Skills

- Languages & Software:** MATLAB, Python, LabView, Minitab, Excel Macros, PLM software, LabVIEW
- Design & Analysis Tools:** AutoCAD, SOLIDWORKS, CATIA V5, Fusion 360, PTC Creo, Siemens NX, ANSYS, COMSOL Multiphysics, Abaqus, GD&T
- Certification:** Six Sigma Green Belt, Machine Learning, Programming for Everybody, Python for Mechanical Engineers, Statistical Thermodynamics, Robotics, Digital Manufacturing & Design Technology, Multi-Axis CNC Toolpaths, Autodesk CAD/CAM for Manufacturing, Autodesk Generative Design for Manufacturing, CAD and Digital Manufacturing, Autodesk CAD/CAM/CAE for Mechanical Engineering

Professional Experience

Smith & Nephew

Austin, TX

R&D Mechanical Engineer II

March 2025-Present

- Designed and optimized next-gen electromechanical controller components using SolidWorks 2021, ensuring compliance with ISO 13485, FDA, and GMP standards for medical devices.
- Developed plastic molded and sheet metal parts with a focus on DFM/DFA, structural integrity, and cost-efficiency, collaborating with cross-functional teams and suppliers.
- Applied GD&T principles to ensure tight tolerances and reliable assembly, improving manufacturability and product consistency across development and production.

Baxter

Round Lake, IL

R&D Mechanical Engineer

Sept 2023-Feb 2025

- Designed and managed complex CAD assemblies in Creo, supporting BOM updates, engineering changes, and documentation within PLM systems to maintain regulatory compliance.
- Led mechanical verification efforts through test protocols, validation, Gauge R&R studies, and life cycle testing, ensuring robust quality assurance and product reliability.
- Applied DFM/DFA, Six Sigma, and Lean principles to reduce production costs and cycle times while optimizing design durability and manufacturing efficiency through FEA and simulation modeling.

Solinst Canada Ltd.

Tempe, AZ

Mechanical Engineer

June 2023-Aug 2023

- Designed and prototyped mechanical packer components in SolidWorks, ensuring functionality, manufacturability, and adherence to quality standards through iterative modeling and testing.
- Conducted CFD simulations in ANSYS to optimize structural integrity and performance, enhancing product reliability and efficiency to meet project requirements.

Air India Limited

Mumbai, India

Research Assistant

October 2021-May 2023

- Collaborated with Aircraft Maintenance Engineers on the overhaul and assembly of PW4056 and GE-90 engines, applying NDT techniques to ensure safety, compliance, and airworthiness.
- Improved engine performance by 10% through precise reassembly of compressor modules, while maintaining detailed maintenance records and adhering to industry standards.

Publications

- Tengteng Tang, Ashiquzzaman Nipu, **Lakshya Tiwari**, Minju Yoo, Xiangjia Li*, " Effects of Interfacial Polymer Structures on Metallic Growth in Electrically assisted Vat Photopolymerization for Heterogenous Metal/Polymer Printing," Journal of Manufacturing Processes, **to be submitted**.
- Tang, T., Joralmon, D., **Tiwari, L.**, Ravishekar, R., He, Q., Pham, L., Yang, Y., Li, X. (2024). "Additive manufacturing of polymer matrix composites via direct ink writing process." Additive Manufacturing of Polymer-Based Composite Materials.
- Tiwari, L.** (2023). "Physical Modeling and Simulation of Polymeric Structures with Metallic Material Printed by Electrically Assisted Vat Photopolymerization for Property Enhancements." Arizona State University.
- Tiwari, L.**, Tang, T., Rong, J., Shan, W., Yang, Y., Li, X. (2022). "Thermoelectric material fabrication using mask image projection based Stereolithography integrated with hot pressing." Journal of Material Science and Technology Research, 9(1), 105-113.
- Dubey, P., Pramod, M.Y., **Tiwari, L.**, Kannan, B.T. (2020). "Preliminary aeroacoustics measurements of conditioned jet flow from a circular nozzle." IOP Conference Series: Materials Science and Engineering, 912(2), 022024.