TRYAKSH GUPTA

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EDUCATION

University of Michigan   **Ann Arbor, MI**
- *Master of Science in Mechanical Engineering (GPA: 4.00 / 4.00)*   *Aug 2021 – Apr 2023*
- *Graduate Certificate in Computational Discovery and Engineering*   *Jan 2023 – Apr 2023*

Indian Institute of Technology (IIT) Roorkee   **Roorkee, India**
- *B. Tech. in Mechanical Engineering (GPA: 9.24 / 10.00)*   *July 2016 - July 2020*

SKILLS

Programming: C++, Python, Linux, Shell/Bash, Git, MATLAB, Visual Studio, HPC, ROS2
Product Strategy: Roadmapping, Competitive research, Value Proposition, MVP Definition, Launch & Shipping, Jira/OSC
Tools & Platforms: Microsoft Office Suite, Adobe Suite, SolidWorks, Simulink, Abaqus CAE, ANSYS
Lab & Engineering: Rapid Prototyping, Multi-Physics, Design of Experiments, Testing & Validation

WORK EXPERIENCE

Spatial Corp (Dassault Systèmes)   **Broomfield, CO**
Product Manager – Modeling and Simulation SDKs   *July 2023 - present*
- Leading development of a new robotic motion planning product; integrated it in a scalable simulation framework (AGM) and simulated optimal, collision-free motions in CAD-based industrial environments
- Mapped workflows with robotics OEMs and integrators to define product roadmap and market fit in automation
- Delivered product proof-of-concepts for automation use cases; leading 3 OEMs collaborations towards deployment
- Secured 2 new customer wins and displaced a key competitor through successful relaunch and market repositioning of CDS with customer-focused C++ workflows — accelerating revenue recognition
- Led customer-facing engagements for CSM/CVM meshing SDKs, delivering simulation-ready workflows that powered 4 customer applications and contributed to a product driving ~5% of company revenue; won Spatial Excellence Award 2025
- Spearheading AI-guided mesh generation trained on FEM outputs – a next-gen initiative for predictive, solution-aware meshing

Computational Physics Group   **Ann Arbor, MI**
Research Associate II (Toyota Research Collaboration)   *Dec 2021 – July 2023*
- Contributed to multi-physics computational model at particle scale to study aging mechanisms in the solid-state Li-ion battery
- Simulated stress-dependent kinetics, deformation & capacity fade using a strong discontinuity method for fracture modeling
- Developed OpenCV-based image processing workflow to convert the cell particle images to simulation-ready FE data
- Designed control algorithms to simulate battery degradation over several cycles using Linux-based HPC clusters
- **Publication:** Zhang, X., Gupta, T., et al. (2024). *A treatment of particle electrolyte sharp interface fracture in solid-state batteries with multi-field discontinuities. Journal of the Mechanics and Physics of Solids*, 182, 105490. DOI
- **Funded** by Toyota Research Institute (Award #849910) - *Computational framework for data-driven, predictive, multi-scale and multi-physics modelling of battery materials*

Tesla   **Fremont, CA**
Battery Cell Engineering Intern   *May 2022 – Aug 2022*
- Designed and tested a novel electrostatic + vacuum-based cleaning system for battery cells; partnered with a UK vendor to manufacture test prototype and deploy it across high-volume cell lines
- Executed sensor-driven experiments using inline defect imaging systems to iteratively optimize parameters of electrostatic cleaning hardware in a live production line
- Prototyped cell powder delivery system using a vibrating conveyor to eliminate clogging; successfully tested at Giga Texas

Team KNOx, IIT Roorkee   **Roorkee, India**
CAE Head   *July 2018 - July 2020*
- Led structural simulation and optimization for an off-road vehicle chassis; achieved 22% weight reduction while meeting safety thresholds; directed CAE efforts for a 35-member team and participated in BAJA SAE India

CNRS, Sorbonne University   **Paris, France**
Research Intern   *June 2019 - July 2019*
- Developed a crack growth model using cohesive zone elements in Abaqus to simulate fracture in metallic alloys, and validated it using experimental data from a professor-led startup collaboration.

ACADEMIC PROJECTS

Dynamic Modeling of Mechanical Thrombectomy Device | *University of Michigan*   *Jan 2023 - Apr 2023*
- Optimized the design of an oscillating Thrombectomy device by modeling and simulating the interaction between the tool and blood clots in MATLAB/Simulink

Helicopter's Ice-Detection System | *University of Michigan*   *Jan 2023 - Apr 2023*
- Developed ice-detection system to predict the severity of icing on helicopter blades from acoustic and CFD data, using Bayesian Neural Networks

Hybrid Commercial Truck | *Term Project, University of Michigan*   *Jan 2022 - Apr 2022*
- Built power-split hybrid architecture in MATLAB/Simulink that improved the performance of the truck by ~29% in a neighbourhood garbage truck drive cycle while integrating regenerative braking

Fatigue failure prediction in Aero-engine Disc | *Research Assistant, IIT Roorkee*   *Aug. 2019 – Jul. 2020*
- Developed numerical technique in MATLAB to predict the Fatigue Crack Growth in an Aero-Engine Disc subjected to spectrum fatigue loading and high temperature of operation and validated the results using Fatigue test