Manoj Malviya | Software Engineer

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*Versatile and collaborative **Software Engineer** with over **4 years** of development experience in **CAD Applications**. Strong problem-solver with a customer-first mindset, a history of leading complex projects to successful, timely completion.*

Technical Skills

Programming Languages	**C++**, Python, QML, JavaScript, HTML, MATLAB, SQL
Tools & Frameworks	Qt, OpenGL, React, TensorFlow, Django, Docker, Git, Jira, Figma
Software Concepts	UI-Development, Test-Driven Development, Embedded Systems, Agile Methodology
Mathematics	Linear-Algebra, FEA, Computer-Graphics, Optimization, Generative AI

Work Experience

Software Engineer | *Formlabs Inc* *Sep 2023 - Present*

- Spearheaded the development of a next-gen UI framework for a Desktop Application, reducing workflow time by 30% through modular design and collaboration with the UX team. Utilized C++, QML, Figma and Qt Framework.
- Engineered a high-performance print-preparation feature for 3D Printing, optimizing part packing and caging through spatial algorithms. Collaborated with product managers and customers, reducing post-processing time by 50%.
- Pioneered a novel topology algorithm for support structures, utilizing lattices and FEA. Achieved up to 70% material savings while maintaining critical stiffness, with enhanced speed through a novel optimization approach.Patent Pending
- Drove the creation of Form4 Camera features (live-stream and timelapse), enhancing print-monitoring capabilities.
- Improved Print-Time Estimator accuracy by 20% and boosted performance by 70%, providing real-time feedback to users.
- Architected and developed a maintenance tool for 3D Printer consumables, designing the UI and significantly improving product health monitoring and predictive maintenance.
- Recipient of Perform Award, given in recognition of productivity and performance to Formlabs top 30 engineers.

R&D Engineer | *Formlabs Inc* *Jan 2021 - Sep 2023*

- Led feature-development for automated support structure generation, optimizing for stability and material efficiency for 3D Printing. Introduced light touchtip supports, driving 50% usage growth and reducing print-failure rate by 15%.
- Engineered and optimized motion-planning, image-processing, and mesh-generation algorithms. Developed computational and experimental models to boost print success, quality, and speed for 3D-Printers, establishing them as industry-leading.
- Developed and maintained web-based computational tools for data collection, printer-farm management, and computational experiments, reducing workflow time by 80-90% for internal tasks. Utilized Django, Docker, and Python.
- Managed engineering interns, facilitating knowledge transfer in development practices, system design, and optimization. Assisted fellow team members in onboarding and learning the same principles to accelerate their growth in the team.

Research Assistant | *Pennsylvania State University* *Aug 2018 - Aug 2020*

- Automated the design process for embedding objects into additively manufactured parts by developing a novel Computational Graphics algorithm to simulate and generate optimal geometries. IDETC-19, Journal of Mechanical Design
- Developed an interactive digital version of the Delta Design Game, enabling real-time data collection and analysis of design behaviors using Hidden Markov Models. Github
- Devised a design experiment to characterize re-design strategies for additive manufacturing using eye-tracking technology. Developed a data analysis tool leveraging probabilistic models. SFF-19, Journal Mechanical Design
- Coauthored 7 peer-reviewed publications and presented research at scientific seminars, weekly meetings, thesis defenses, and international conferences. Mentored undergraduate students on their Honors' theses.

Education

Master of Science in Mechanical Engineering | *Pennsylvania State University*
GPA - 3.88/4 | Coursework- Algorithm Development, Computational Design, Optimization, 3D Printing

Bachelors of Technology in Mechanical Engineering | *Indian Institute of Technology*
GPA - 3.95/4 | Coursework- Engineering Design, Numerical-Optimization

Projects

- **Build orientation selection tool** for AM that maximizes the minimum factor of safety under prescribed loading and boundary condition. CAD-19, CAD-Journal
- **Cub Companion**- Designed a UI-mock-up application for cancer-diagnosed kids, by conducting and analyzing user-interviews, surveys and mock-up design phases.
- **Rapid Topology Optimization** using a novel Generative Adverserial Deep Learning Network PrePrint
- **Personal Portfolio** using modern-UI, using HTML and JavaScript. Website
- **SAE BAJA 2016-18** Led a team of 25 students for designing and manufacturing All-Terrain Vehicle