Manoj Malviya | Software Engineer

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Software Engineer with over **6 years** of experience in **CAD** and **3D Printing**. Strong problem-solver with a data-driven and user-first mindset, with a proven track record in driving innovation and delivering high-performance features for industrial-grade applications.

Technical Skills

Languages	**C++**, Python, QML, JavaScript, HTML, MATLAB, SQL
Frameworks	Qt, Bootstrap, React, TensorFlow, Django
Tools	Docker, Git, Jira, Figma, AWS, Redash, Grafana
Software Concepts	UI-Development, Embedded Systems, Agile Methodology
Mathematics	Linear-Algebra, Computer-Graphics, Optimization, Data-Driven Algorithms

Work Experience

Software Engineer, R&D | *Formlabs Inc* *Sep 2023 - Present*

- Led the end-to-end development of high-performance, user-facing features for a print-preparation application, improving workflow efficiency by 30% and ensuring scalability across releases.
- Revitalized SLA Support Generation by inventing a **patent-pending** high-performance optimization algorithm, resulting in a 70% reduction in material and significantly improving system efficiency. Introduced light touchtip supports, driving 50% usage growth and reducing print-failure rate by 15%.
- Led the development of a modular, scalable UI framework using C++ and QML. Facilitated seamless collaboration with designers and beta users, achieving a ~27% improvement in user experience.
- Architected and developed advanced predictive maintenance tools for large-format 3D printers, enhancing product health monitoring and reducing downtime for large-scale industrial clients.
- Engineered and optimized motion-planning, image-processing, and mesh-generation algorithms, to boost print success, quality, and speed for 3D-Printers, establishing them as industry-leading.
- Developed and maintained web-based computational tools for internal data collection, data-analysis and product management, reducing users workflow time up to 85%. Hosted the website using Docker, Django, and AWS.
- Collaborated closely with the team: managed 6 interns, lead pair programming sessions, reviewed new code, conducted user studies, fixed critical bugs, and set coding standards to drive feature development.
- Recipient of Perform Award, given in recognition of productivity and performance to Top 3 engineers.

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

- Developed novel computational algorithms to automate design processes for embedding in additive manufacturing, resulting in published research in top mechanical design journals. Conference, Journal
- Engineered data analysis tools and interactive design experiments, using eye-tracking technology and probabilistic models to improve user insights. Journal
- 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 | Algorithm Development, Computational Design, Optimization, Data-Driven Design

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

Projects

- **Build orientation selection tool**: Developed a tool for additive manufacturing selecting orientation for maximum reliability. CAD-19, CAD-Journal
- **Personal Portfolio**: Implementing modern-UI framework, using HTML and JavaScript. Website
- **Generative AI for Topology Optimization**: Developed a deep learning model for rapid topology optimization for faster results. Preprint
- **SAE BAJA 2016-18**: Led a team of 25 students for designing and manufacturing All-Terrain Vehicle