Manoj Malviya | Software Engineer

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Versatile, language agnostic software engineer with 6+ years of professional experience. Strong problem-solver with a user-first mindset, and a track record of leading complex projects and delivering elegant solutions.

Skills

Core Competencies	Programming Language	Frameworks	Tools	Concepts
3D Graphics · UI Development · API & System Design	C++ · Python · QML · JavaScript · HTML · MATLAB · SQL	OpenGL · Qt · React, TensorFlow · Django, PyQt · Vulcan	Git· Jira · Figma · AWS · Redash · Grafana· Docker · Kubernetes	Linear Algebra · Optimization · Agile · Machine Learning

Work Experience

Software Engineer | Formlabs

JAN 2021 – PRESENT

- Led **CAD features development** for a 3D modeling and print-preparation software; extensively worked on the graphics component, greatly improving user interaction and workflow (e.g. optimized rendering performance, reducing model manipulation time in a 400+ 3D Models scene from 8s to 600ms).
- Took ownership of the **end-to-end development** of high performance user-facing features, improving workflow efficiency by ~30% and ensuring scalability across releases.
- Revamped the core product feature and pioneered a **patent-pending** high-performance optimization algorithm, that significantly improved usability, and resulted in a 35% reduction in end-user burden.
- Spearheaded 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.
- Initiated and developed **large-scale data analysis** tools, enabling data-driven feature development and strategic decision-making. Used SQL, Redash, and Segment logging.
- Collaborated closely with the team: managed 6 interns, lead pair programming sessions, reviewed code changes, 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 - DEC 2020

- Developed novel 3D graphics algorithms to automate design processes for embedding in additive manufacturing, resulting in published research in top mechanical design journals (Journal, Blog).
- 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.

Projects

- **3D Printing Orientation Selector:** Developed a tool for additive manufacturing orientation optimization for maximum reliability, using Linear Algebra and Machine Learning (Journal).
- **Personal Portfolio:** Developed a modern portfolio from scratch in one month, using HTML and JavaScript, featuring web tools like Music Visualizer.
- **Generative AI for Topology Optimization:** Developed a deep learning model for rapid topology optimization for faster results (Preprint).
- **Mock Application Development:** Developed a game for cancer patients, conducting and analyzing user interviews, surveys, and mock-up design phases.

Education

Pennsylvania State University

Master of Science
Mechanical Engineering

3.88/4.0 GPA
Algorithm Development, Computational Design, Optimization, 3D Rendering

Indian Institute of Technology

Bachelor of Technology
Mechanical Engineering

3.95/4.0 GPA
Engineering Design, Numerical Optimization