

Shubham Singh

Lead Software Developer Engineer

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Profile

Lead Software Developer Engineer with 3 years(34+ months) of experience specializing in the MERN stack as a Founding Engineer. Proficient in creating responsive interfaces, robust APIs, and desktop applications using Tauri. Experienced with Next.js, CSS/SCSS modules, WebRTC/peer-to-peer communication, Socket.io, and WASM. Skilled in AWS hosting, Docker and Docker Compose, CI/CD with GitHub workflows, DevOps, and full-stack hosting. Expertise in Three.js and React Three Fiber for 3D applications. Utilize advanced performance optimization techniques such as memoization and debouncing. Proven leader in delivering high-quality, bug-free applications by guiding the software team, refactoring code, and implementing new features.

Skills

- **Programming Languages:** JavaScript, TypeScript, Python, HTML, CSS
- **Frontend Technologies:** React.js, Next.js, CSS/SCSS, WebRTC/peer-to-peer communication, Redux, Redux Toolkit
- **Backend Technologies:** Node.js, Express.js, Flask, WebSockets, RESTful APIs
- **Desktop Applications:** Tauri, Electron
- **Database Management:** MongoDB, MSSQL Server, AWS RDS
- **DevOps and CI/CD:** Docker, Docker Compose, Podman, Podman Compose, GitHub Actions, AWS Hosting, Nginx
- **Performance Optimization:** Memoization, Debouncing, Throttling, Code Refactoring, WebAssembly with emscripten
- **3D Technologies:** Three.js, React Three Fiber, CAD
- **Security:** JWT Authentication, RSA and AES Encryption, SSL Certificates with reverse proxy and load balancing
- **Tools:** Git, Nginx Proxy Manager, Cloudinary
- **Soft Skills:** Team Leadership, Problem-Solving, Collaboration, Communication

Education

B.E., Mech. [University Institute of Engineering and Technology, Punjab University](#) **Chandigarh, IN** 2019-2023
• Projects: Bionic Prosthetic Arm- DIC(Design and innovation center, PU), Battery Thermal Management system- NTU(Nottingham Trent University)/PU-DIC, Mechanical Optimizations for Legs Prosthetics- Tynor Orthotics Pvt. Ltd./PU, National Electric Karting Championship- AIR 1 .
• Papers and Patents: Bionic Prosthetic Arm([Patent](#)), Battery Thermal Management System([Research Paper- Elsevier](#)).

Science, Non-Medical, CBSE [GMSSS, Sector 16D](#) **Chandigarh, IN** 2017-2019
• Passed in 2019 while Securing 68 percent in the inter-education CBSE board examination

High education, CBSE [GMHS, Khudda Jassu](#) **Chandigarh, IN** 2004-2017
• Passed in 2017 while Securing 9.4 CGPA in the high-education CBSE board examination

Professional Experience

Lead Software Developer Engineer, [ThinkMetal Pvt. Ltd.](#) **Chennai, Tamil Nadu, IN** 09/2023 - present
• Led the development of full-stack applications using the MERN stack, ensuring high performance and responsiveness.
• Created desktop application using Tauri, enhancing cross-platform capabilities.
• Utilized WebAssembly (WASM) for preparing objects to slice them into G-codes, creating printer toolhead/extruder paths for the printer to understand.
• Used Socket.io for real-time communication features and WebRTC for encrypted remote access.
• Implemented CI/CD pipelines with GitHub workflows for automated builds and deployment.
• Deployed applications on AWS using Docker and Docker Compose, managing AWS DNS hosted zones and VPS hosting.
• Applied advanced performance optimization techniques like memoization and debouncing to improve application efficiency.
• Monitored and controlled print progress using React's Context API and Reducer API for global state management.
• Managed print data and history on an AWS database with secure APIs, containerized using Docker/Podman and Docker/Podman Compose.
• Provided real-time camera feed using WebRTC from the machine to the desktop application for better monitoring of the parts being printed.
• Super admin controls access to the printers via a web-based panel with JWT-based authorization.
• Guided the software team in following best practices, code refactoring, and feature implementation to maintain a bug-free application.
• Integrated an embedded Express server in the machine for direct control of printer actions from the desktop app and touchscreen interface.

Front End Web Developer, [XCode Web Solutions LLP](#)

Chandigarh, IN 01/2023 - 09/2023

- Developing business logic according to client needs and requirements.
- Increased productivity by using software to organize, track bug patches, and add feature requests.
- Collaborated with other developers to update the website and create new features.
- Designed and Built RESTful APIs for seamless communication between frontend and backend components.
- Proficiently worked with Node.js and Express.js to build scalable and efficient server-side applications.
- Responsive and user-friendly interfaces using React.js and CSS, focusing on dynamic and interactive components.
- Built an application in Vue.js and Flask for visualizing code changes from GitLab webhooks and integrated OpenAI's ChatGPT API for code enhancement suggestions.
- Functionality in Next.js for property listing, including multi-step forms, image upload with Cloudinary, and MSSQL Server database integration.
- Email signature templates using table HTML elements and base64 images to ensure email client compliance.
- Enhanced the official landing page with animations, reusable components and proper CSS structure for better UI/UX.

Areas of Expertise

Team Leadership - MERN Stack Development - Robust APIs - Responsive Interfaces - Next.js - Tauri Desktop Applications - Redux and Redux toolkit - Performance Optimization (Memoization & Debouncing) - Docker & Docker Compose - CI/CD with GitHub Workflows - AWS Hosting - Full-Stack Hosting - DevOps - WebRTC/peer-to-peer communication - Socket.io - Three.js & React Three Fiber - CSS/SCSS Modules - Code Refactoring - Feature Implementation - Version Control - Containerization - Code Review and Mentorship - Scalability and Performance Tuning - User Authentication and Authorization - Flask - Webhooks - Cloudinary - MSSQL Server - ORM

Relevant Projects

Thinkware Desktop Application, [ThinkMetal Pvt. Ltd.](#) 09/2023 - present

Tech Stack: **Tauri**, **React**, **WebAssembly (WASM)**, **Socket.io**, **WebRTC**, **AWS**, **RSA** and **AES** encryption, **Websockets**, **JWT**

- A desktop application, using **Tauri** and **React** for controlling a metal 3D printer.
- Enabled users to upload, place, and orient 3D models in a real-time **interactive 3D environment**.
- Integrated features such as **auto-placement of multiple objects, selection of materials, density, and printer settings**.
- Engineered a **G-code** preview to visualize the printer's path and how it would print the object in 3D.
- Used **WebAssembly (WASM)** to prepare objects for slicing into G-codes, creating precise toolhead paths.
- Established **APIs** for wireless machine interaction, using **Socket.io** for local real-time data, and **WebRTC** for **encrypted remote access**.
- Secured data with **RSA encryption**, using secure **WSS protocol** and **AWS-hosted WebSocket** servers.
- Managed print data and history on an **AWS database** with secure APIs(secured and isolated via containerization).
- Integrated an **Express.js HTTP server** behind an **Nginx proxy** for **HTTPS** enforcement and reverse proxying, with **SSL certificates** via **Let's Encrypt**.
- Monitored and controlled print progress using **React's Context API** and **Reducer API** for global state management.
- Provided real-time camera feed using **WebRTC** from the printer to the desktop application.
- Super admin controls access to the printers through a web-based online admin panel with **JWT-based authorization**.
- Integrated an embedded **Express server** in the machine for direct control of printer actions from the desktop app and touchscreen interface.

Thinkware Backend (on Embedded Hardware), [ThinkMetal Pvt. Ltd.](#) 09/2023 - present

Tech Stack: **Node.js**, **Express.js**, **WebSockets**, **React**, **Embedded-Systems**

- Built a backend system on the printer's embedded hardware using **Node.js**, **Express**, and **WebSockets**.
- **APIs** to abstract printer controls like moving the toolhead, bed, and handling heating tasks.
- Ensured seamless communication between the desktop application and the machine's backend.
- A **React application** for the machine's touchscreen, providing monitoring and control features.
- Integrated an embedded **Express server** for controlling printer actions directly from the desktop app and touchscreen interface.

Thinkware Cloud Backend, [ThinkMetal Pvt. Ltd.](#) 09/2023 - present

Tech Stack: **Express.js**, **AWS**, **Docker**, **Nginx**, **JWT**

- A cloud-based backend for handling APIs and database operations using **Express.js**.
- Managed **AWS-managed databases** with secure API interactions, containerized using **Docker**.
- Set up **Nginx Proxy Manager** for load balancing, **HTTPS** enforcement, and **SSL certificate management**.
- Integrated **JWT-based authentication** for secure access to cloud services and data storage.

Thinkware Peer-to-Peer Handshake Server, [ThinkMetal Pvt. Ltd.](#) 09/2023 - present

Tech Stack: **Node.js**, **WebSocket**, **TypeScript**, **SSL/TLS**

- A handshake/Signaling server to **facilitate peer-to-peer communication** between the desktop app and printers.
- Used **Node.js**, **WebSocket**, and **TypeScript** for real-time availability checks and connection management.
- Configured **SSL/TLS** for secure WebSocket communication via **WSS protocol**.
- Established a reliable and secure connection layer using **HTTPS** for initiating WebSocket connections.

ThinkMetal Website Development, [ThinkMetal Pvt. Ltd.](#) 09/2023 - present

Tech Stack: **Next.js**, **SASS**, **Module SCSS**, **gray-matter**

- Maintaining and developing new parts of the ThinkMetal website, including the **landing page** written in **Next.js**.
- Used **SASS** and **Module SCSS** for styling and implementing a **refactor** of the existing codebase.
- Added features like the **Contact Us form**, **Newsletter signup**, and **Blogs** generated from **Markdown to HTML** using **gray-matter**.
- Implemented a **dynamic career list** feature for updating available job opportunities.

Official Landing Page, [XCode Web Solutions LLP](#)

01/2023 - 09/2023

Tech Stack: **React.js, CSS, JavaScript**

- Enhanced the landing page with animations, reusable components, and a proper **CSS structure** using **CSS variables**.
- Integrated an embedded-map, team page, and interactive elements for improved user experience.
- Implemented **JS intersection observer** for playing animations when elements come into view.
- Developed responsive forms and links with proper structured data for navigation and interactivity.

Property Listing Platform, [XCode Web Solutions LLP](#)

01/2023 - 09/2023

Tech Stack: **Next.js, Cloudinary, MSSQL Server**

- A **Next.js** application for property listings with a multi-step form wizard.
- Integrated **Cloudinary** for image uploads and **MSSQL Server** for database management.
- Implemented state management across multiple form steps and handled optional/mandatory fields and validations.

Code Enhancement Application, [XCode Web Solutions LLP](#)

01/2023 - 09/2023

Tech Stack: **Vue.js, Flask, GitLab Webhooks, OpenAI API**

- Built an application using **Vue.js** and **Flask** to process **GitLab webhooks**.
- Consumed **GitLab's webhook** to create an application that has a webhook endpoint hit on every commit to a repository connected with our application.
- Implemented backend logic to fetch file changes and send data to **OpenAI's ChatGPT** for code improvement suggestions.
- Displayed code differences and suggestions on the frontend for manager review and approval.

Financial Application with React.js and OData API, [XCode Web Solutions LLP](#)

01/2023 - 09/2023

Tech Stack: **React.js, OData API, Fluent UI, Redux Toolkit**

- Maintained a large financial application using **React.js** and **OData API** for industry-standard data handling.
- Employed **Fluent UI** for creating a standardized and professional user interface with custom components.
- Followed clean code principles to ensure a maintainable and scalable codebase.
- Collaborated with a large development team using proper branching strategies, ticketing systems, and time tracking for efficient project management.
- Utilized **Redux Toolkit** with a custom entities system for standardized state management.

Online Courses & Certifications

Programming Foundations: Data Structures (2019) - [LinkedIn](#)

JavaScript Essential Training - [LinkedIn](#)

React.js Essential Training - [LinkedIn](#)

Learning Node.js - [LinkedIn](#)