

# Shubham Kumar Mahato

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## PROJECTS

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### SoundSync – Scalable Music Sharing Platform

 GitHub

- *Tech stack:* TypeScript, React, Tailwind CSS, Node.js, Supabase
- Built a full-stack music streaming app with personalized playlists and secure GitHub OAuth-based authentication.
- Integrated Supabase for real-time data sync and optimized API endpoints to handle 500+ requests/sec.
- Enabled playlist collaboration and sharing features to enhance social interaction.

### SketchHive – Real-Time Collaborative Design Editor

 GitHub

- *Tech stack:* Next.js, TypeScript, WebSockets, Tailwind CSS
- Created a Figma-style design tool with real-time collaboration using WebSockets and layer-based editing.
- Optimized rendering performance for large canvases and added export support (PNG, JPEG, SVG).

### FlexDash – Customizable Dashboard Builder

 GitHub

- *Tech stack:* Next.js App Router, Tailwind CSS, DnD-kit, Server Actions
- Developed a drag-and-drop platform for building custom dashboards with widgets (charts, KPIs, APIs).
- Used Server Actions to persist user configurations and Server Components for optimized rendering.

### DecentraPRO – Blockchain-Based dApp for Transactions

 GitHub

- *Tech stack:* React, Node.js, Ethers.js, MetaMask
- Built a decentralized web app that allows users to perform basic token transactions on a blockchain network.
- Integrated MetaMask wallet for secure user authentication and transaction signing.
- Focused on smart contract interaction, dApp architecture, and real-time transaction feedback.

## TECHNICAL SKILLS

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**Languages:** C/C++, Java, Python, JavaScript, TypeScript, SQL, Bash.

**Frameworks & Libraries:** React.js, Next.js, Node.js, Turborepo, WebSockets, WebRTC.

**Databases:** MongoDB (NoSQL), PostgreSQL (SQL), ORMs (Mongoose, Prisma).

**Styling:** Tailwind CSS, Material-UI.

**Python Libraries:** NumPy, Pandas, scikit-learn, XGBoost, Matplotlib, Streamlit.

**DevOps Tools:** Linux, Bash scripting, Docker, ECS, Kubernetes, Terraform, Helm, GitHub Actions (CI/CD), GitOps, AWS EC2, GCP VMs, ASGs, MIGs, CDNs, Object stores, Prometheus/Grafana (Monitoring).

**Web3:** Ethereum client-side apps, Solana client-side apps, EVM, Solana data model, adapters.

## RESEARCH AND PAPER WORK

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### Study of Delay Differential Equations with Applications in Population Dynamics

- Gained a comprehensive understanding of delay differential equations (DDEs) and their unique properties.
- Developed mathematical models to represent real-world population dynamics, including time delays.
- Used MATLAB and Python to simulate scenarios and analyze population stability.
- Presented findings through detailed graphical visualizations.

## EDUCATION

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### Birla Institute of Technology, Mesra

*Integrated Masters of Science in Mathematics and Computing*

Ranchi, Jharkhand

*Dec. 2021 – Present*

### DAV Public School Bistupur

*Class XII*

Jamshedpur, Jharkhand

*March 2018 – April 2020*

## ACHIEVEMENTS

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Solved over 600+ coding problems on LeetCode and HackerRank, demonstrating expertise in DSA.

Published a research paper on delay differential equations and population dynamics.

Achieved a 5-star rating in Python and SQL on HackerRank.