

SUDIP DE

Delhi, India

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Software engineer 1.5+ years of academic research, project, and industry experience across mobile, full-stack, and AI systems. Proficient in building scalable, high-performance applications using modern frameworks, cloud infrastructure, containerized deployments, and clean system architecture.

EDUCATION

Indian Institute of Technology Delhi, *M.Sc in Mathematics* | Delhi, India

Jul 2023 - Ongoing

Vidyasagar University, *M.Sc in Applied Mathematics* | Midnapore, India

Nov 2021 - Sept 2022

(Completed first-year coursework before transferring)

Panskura Banamali College, *B.Sc (Hons.) in Mathematics* | Panskura, India

Jul 2018 - Aug 2021

Courses: C & C++ Programming | Linear Algebra | Graph Theory | Optimization | Operations Research | Numerical Methods | Probability Theory | Statistics | Multiple Decision Procedures | PDE | Image & Signal Processing

WORK EXPERIENCE

OAE IIT Delhi, *Software Developer Intern* | On-site (IIT Delhi, Delhi, India)

Nov 2025 - Jan 2026

- Architected and developed a scalable **cross-platform mobile application using React Native**, which included dedicated dashboards for students and drivers for courses, ride booking, billing, and academic schedule tracking.
- Built a scalable **admin panel** using **TypeScript** and **React (Vite)** for the purpose of user management, role-based access control, course management, and analytics visualization by securely integrating APIs.
- Designed and implemented **backend services** that integrated **Fiber (Go)**, **MongoDB** and **Redis**, ensuring a secure, low-latency, real-time, and scalable data flow for both mobile and web clients
- The ride updates in **real-time** were implemented with **WebSocket** communication
- Collaborated on **UX/UI guidelines**, to enhance the user experience on both **iOS** and **Android platforms**
- Containerized services using **Docker** and deployed them on **Kubernetes on Azure**
- Built and maintained **CI/CD pipelines** to automate build, test and deployment workflows
- Successfully published and maintained production applications on **Google Play Store** and **Apple App Store**.

Wattmonk Technologies, *AI Engineer Intern* | Full-time (Gurgaon, Haryana, India)

Jul 2025

- Designed and implemented **AI-driven automation solutions** to enhance business workflows and operational efficiency.
- Collaborated with **engineering, product, and operations teams** to identify and integrate high-impact AI applications.
- Built, tested, and deployed **machine learning models** using **Node.js**, **Gemini**, and other relevant AI frameworks.
- Contributed to **intelligent decision systems** that improved data accuracy and real-time processing speed.

SBI Life Insurance Co. Ltd., *Insurance Advisor* | Part-time (Ghatal, WB, India)

Nov 2022 - Dec 2024

- Managed **policy advisory, onboarding, and customer relationship management** for **100+ clients**
- Increased renewal rates from **60%** to **83%** by following up with clients.
- Achieved **100% policy persistency**, Leveraged **RMI analytics** to monitor performance metrics and improve business outcomes.

RESEARCH & LAB EXPERIENCE

Research Project, *Under the guidance of Prof. Sumer Singh* | IIT Delhi (Delhi, India)

Jan 2025 - May 2025

- This research on the modeling and reduction of vehicular CO_2 emissions as a part of Delhi's roadmap to carbon neutrality.
- Applied stochastic and data-driven models on emissions trends and potential opportunities for emissions reduction.
- Ran scenario based modeling simulations and comparative emissions data analyses, assessed the effectiveness of emission control policy option might be.

SKILLS

Programming Languages	C/C++, JavaScript, TypeScript, Dart, Java, Go, Python, SQL
Frontend	HTML, CSS, Vite, React, Angular, Redux, Tailwind CSS, Bootstrap
Backend & APIs	Node.js, Spring Boot, Gin/Fiber, FastAPI, Django, REST & LLM APIs
Mobile	React Native, Flutter, Android (Kotlin), iOS (Swift)
Databases	PostgreSQL, MySQL, MongoDB, SQLite, Redis, Firebase
Cloud & DevOps	Docker, Kubernetes, Terraform, Jenkins, CI/CD, Git, GitHub Actions, AWS, GCP
Testing & Quality	Unit, Integration, Component, End-to-End Testing using Vitest, PyTest, Playwright
Software Tools	Linux, Docker, VS Code, Xcode, Android Studio

PROJECTS EXPERIENCE

AutoFE-X | Self-Initiated Project

Nov 2025 - Ongoing

- Built **AutoFE-X**, an open-source Python framework that automates feature engineering workflows for machine learning pipelines.
- Designed a **modular architecture** for data preprocessing, feature extraction, and feature transformation.
- Reduced manual feature engineering effort using **intelligent heuristics and optimization strategies** for feature generation and selection.
- Improved downstream model performance and experimentation speed by standardizing and automating repetitive data preparation tasks.
- Published and maintained the package on **PyPI**: (<https://pypi.org/project/autofex/>); source code available on **GitHub**: (<https://github.com/sudo-de/autofex-x>).

Portfolio Optimization for US and Indian Equities: A Probabilistic Expert Fusion

Nov 2025 - Nov 2025

Approach | Under the guidance of Prof. Aparna Mehra | IIT Delhi

- This research on **Probabilistic Expert Fusion (PEF)**, a dynamic Bayesian predictive synthesis framework that extends classical Bayesian Model Averaging to non-stationary multivariate return processes via time-varying expert aggregation weights.
- Applied the model to **20 large-cap equities** from the S&P 500 and Nifty 50 over January 2015–September 2025, PEF generates a coherent posterior predictive distribution that simultaneously informs **mean-variance**, **CVaR-constrained**, and **risk-parity portfolio decisions** under long-only constraints.

SolarAI: Intelligent Rooftop Energy Analysis | Self-Initiated Project

Aug 2025 - Sept 2025

- Built an AI system to convert aerial imagery into **3D roof models** and **ROI projections**, achieving **6X faster processing** than standard tools.
- Designed a rooftop detection and segmentation pipeline using **YOLOv11** and **SegFormer**, achieving a **97.3% mAP** and reducing **false positives by 42%**.
- Implemented a **3D Roof Reconstruction Engine with less than 2% error in surface area estimation**, supporting automatically optimized solar panel layouts.
- Migrated the **backend from FastAPI to Next.js** and optimized **containerization using multi-stage Docker builds**, which is improving **99.9% uptime**, **1.8s time-to-interactive**, and overall deployment size by **63%**
- Source code available on **GitHub**: (<https://github.com/sudo-de/ai-solar-rooftop-analysis>)

X-Crypto-Vault | Self-Initiated Project

Jan 2025 - April 2025

- Designed and implemented a **secure CLI Bitcoin wallet using C++** with deterministic key generation and recovery.
- **BIP-39 mnemonic seed phrases** and **Hierarchical deterministic (HD) wallet architecture** for secure key management.
- Built cryptographic workflows for **key derivation**, **address generation**, and **wallet restoration**, emphasizing correctness and security.
- Source code available on **GitHub**: (<https://github.com/sudo-de/x-crypto-vault>).

HyperLogic AI ChatBot | Self-Initiated Project

Jan 2025 - April 2025

- Architected a modular **modular FastAPI backend** with support for multiple LLM providers (including Gemini), incorporates automatic fallback logic and streaming responses
- Created a **responsive TypeScript & React (Vite)**, features a clean UI, switchable themes, typing indicators, and real-time chat implemented with WebSockets.
- Configured dynamic database switching between **PostgreSQL** and **SQLite** and managed end-to-end deployment using **Docker Compose** and **Nginx**.

Deep Vision System for Biomedical Image Segmentation and Diagnosis | Under the

guidance of Prof. Anup Singh | IIT Delhi

Jan 2024 - May 2024

- Developed an **deep learning-based biomedical image analysis system** for MRI, CT, and microscopy data.
- Implemented **deep learning pipelines** for image segmentation, feature extraction, and multi-class disease classification using **CNN** and **Vision Transformer** models.
- Developed **3D visualization** and **image registration modules** to support comparative anatomical studies and volumetric tissue mapping across time-series scans.
- Automated **diagnostic workflows**, reducing manual analysis time and improving reproducibility.
- Integrated the platform with **PACS/EMR systems** for seamless clinical data access.

Smart Healthcare Assistant (AI + IOT) | Self-Initiated Project

Jul 2023 - Nov 2023

- Designed a **real-time IoT** health monitoring system for tracking heart rate, temperature, and oxygen levels.
- Built an **AI-based diagnosis** that analyzes symptoms and generates data-driven condition forecasts.
- Developed a **React Native** mobile app that provides real-time health insights to both patients and healthcare professionals.
- Implemented real-time alerting using **WebSockets** and **push notifications** for rapid response to critical changes.
- Added encrypted **cloud storage** and access control for secure, **HIPAA-compliant data management**.
- Optimized IoT communication to reduce latency and improve system performance.

CERTIFICATES

<i>React Native</i> , Udemy	Dec 2025
<i>Flutter & Dart</i> , Udemy	Nov 2025
<i>AWS Summit India</i> , Amazon Web Services (AWS) , Bangalore, India	Jun 2025
<i>Google Cybersecurity</i> , Coursera	Apr 2025
<i>Deep Learning</i> , GDSC NSUT , Delhi India	Jan 2024
<i>LaTeX</i> , GITAM , Bangalore, India	July 2021

ACHIEVEMENTS & AWARDS

Qualified GATE 2025 in Mathematics , <i>Organized by IIT Roorkee</i> , Roorkee, India	Apr 2025
Best Wordsmith Award , Securing 1st position <i>NISHAAN IIT Delhi</i> , Delhi, India	Feb 2025
Rising Star Award , <i>SBI Life Insurance Co. Ltd.</i> , Ghatal, India	Jul 2023
Qualified JAM 2023 in Mathematics , <i>Organized by IIT Guwahati</i> , Guwahati, India	Apr 2023
Qualified JAM 2021 in Mathematics , <i>Organized by IISc Banalore</i> , Banalore, India	Apr 2021