

SUDIP DE

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SUMMARY

Backend / Full-Stack Engineer with hands-on experience building scalable APIs, Web, mobile applications, and cloud-native systems. Strong in backend development, containerization, and production deployments.

TECHNICAL SKILLS

Programming Languages	JavaScript, TypeScript, Go, Python, C++, Dart
DSA	Arrays, Strings, Sorting, Dynamic Programming
Frontend	HTML, CSS, React, Redux, Tailwind CSS, Bootstrap
Backend & APIs	Node.js, Gin/Fiber, FastAPI, REST APIs, Microservices, authentication, JWT
Mobile	React Native, Flutter, Android (Kotlin), iOS (Swift)
Databases	PostgreSQL, MySQL, MongoDB, SQLite, Redis
Cloud & DevOps	Docker, Kubernetes, CI/CD, AWS, GCP, Git
Architecture	Microservices, Event-Driven, API Gateway Pattern, MVC/MVVM, Layered
Testing & Quality	Unit, Integration, Component, End-to-End Testing using Vitest, PyTest, Playwright
Tools	Git, Linux, Version Control, Unit Testing, Continuous Integration, Docker, VS Code, Xcode, Android Studio
Design & Modeling	Figma, UI/UX Design
Methodologies	Agile, Scrum

WORK EXPERIENCE

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

Nov 2025 - Jan 2026

- Built a **cross-platform mobile application using React Native** with real-time ride updates via **WebSockets** with sub-200 ms latency.
- Designed **backend services** using **Go (Fiber)**, **PostgreSQL** and **Redis** for low-latency data access
- Designed and implemented high-performance backend services using Go (Fiber), PostgreSQL, and Redis, reducing average API response time by 40%
- Implemented role-based access control and admin dashboards using **React** and **TypeScript**
- Containerized services using Docker and deployed on Kubernetes improving scalability and reducing deployment failures by 60%.
- Published and maintained production applications on Google Play Store and Apple App Store as an official publisher, handling production releases and updates
- I received an award from the Indian Institute of Technology Delhi for developing a production-grade application that is used by over 1,000 students and consistently generates daily revenue.

Watmonk Technologies, AI Engineer Intern | Full-time (Gurgaon, India)

Jun - Jul 2025

- Built **AI-powered automation** and **decision pipelines** for the solar industry using satellite imagery and LLM APIs
- Developed **backend services integrating LLMs (Gemini) using Node.js** to analyze rooftops and generate solar feasibility and ROI estimates
- Designed **structured prompts** and **validation logic** to ensure accurate and explainable outputs
- Collaborated with **product** and **engineering teams** to translate business requirements into deployable AI features

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.

SKILLS

Programming Languages	C/C++, JavaScript, TypeScript, Dart, Python, Git, Bash, SQL
Frontend	HTML, CSS, SvelteKit, Vite, React, Tailwind CSS, Bootstrap
Backend & APIs	Node.js, Express.js, NestJS, FastAPI, Django, REST APIs, GraphQL
Mobile Development	Flutter, Dart, Android(Kotlin, Java), iOS(Swift, Objective-C), React Native
Databases	PostgreSQL, MySQL, MongoDB, SQLite, Firebase, Firestore
Cloud & DevOps	Docker, Kubernetes, Terraform, Jenkins, CI/CD, Git, GitHub Actions, AWS, GCP
Statistics & Modeling	NumPy, Pandas, SciPy, Regression, Hypothesis Testing, Clustering (K-Means, DBSCAN), PCA, Hyperparameter Tuning (GridSearch, Optuna)
Machine Learning & AI	scikit-learn, XGBoost, LightGBM, CatBoost, Random Forest, GenAI(LLMs)
Computer Vision	OpenCV, CNN, YOLO, Vision Transformers, Image Classification, Object Detection
Data Visualization	Matplotlib, Seaborn, Plotly
Architecture	Microservices, Event-Driven, API Gateway Pattern, MVC/MVVM, Layered
Testing & Quality	Unit, Integration, Component, End-to-End Testing using Jest, PyTest, Playwright
Software Tools	Linux, Docker, VS Code, Xcode, Android Studio, LaTeX
Design & Modeling	Figma, UI/UX Design, Autodesk Fusion 360, AutoCAD (2D/3D)
Methodologies	Agile, Scrum

PROJECTS EXPERIENCE

AutoFE-X | Open Source (PyPI: <https://pypi.org/project/autofex/>)

- Built an open-source Python framework that automates feature engineering workflows for ML 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.
- Published and maintained the package on PyPI with a public GitHub repository: (<https://github.com/sudo-de/autofex-x>).

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

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

Nov 2025 - Nov 2025

- 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

- Built an AI system to convert aerial imagery into **3D roof models** and **solar ROI projections**
- Implemented rooftop detection and segmentation pipeline using **YOLO** and **SegFormer**, achieving **high accuracy** and reduced **false positives**
- Developed a **3D Roof Reconstruction pipeline with low surface area estimation error** to support automated panel layout
- Optimized backend and deployment using containerized builds, improving processing speed and reducing deployment size
- Source code: (**GitHub: <https://github.com/sudo-de/ai-solar-rooftop-analysis>**)
- Built an AI system to convert aerial imagery into **3D roof models** and **ROI projections**, achieving **6X faster processing** than standard tools.
- 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

- 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

- Architected a modular **modular FastAPI backend** with support for multiple LLM providers (including Gemini), incorporates automatic fallback logic and streaming responses
- Created a **responsive React**, 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**.

- 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.

EDUCATION

Indian Institute of Technology Delhi, M.Sc in Mathematics Delhi, India	Jul 2023 - Ongoing
Vidyasagar University, M.Sc in Applied Mathematics Midnapore, India (Completed first-year coursework before transferring)	Nov 2021 - Sept 2022
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	

CERTIFICATES

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

ACHIEVEMENTS & AWARDS

Qualified GATE 2025 in Mathematics , Organized by IIT Roorkee, 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 , Organized by IIT Guwahati, Guwahati, India	Apr 2023
Qualified JAM 2021 in Mathematics , Organized by IISc Bangalore, Bangalore, India	Apr 2021

ADDITIONAL
