Sandeep Shivashettar

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Professional Summary

AI and Full-Stack Software Engineer with experience developing enterprise AI applications, backend systems, and production-oriented web platforms. Built an AWS Bedrock-powered healthcare assistant for patient support and report analysis, independently launched a payment-enabled learning platform, and engineered a steel-coil cutting-stock optimizer that reduced planning time from 15 minutes to 2 minutes. Creator of Revkit, an open-source binary-analysis platform. Core strengths include Python, TypeScript, React, Node.js, PostgreSQL, AWS, and applied machine learning.

Education

M. S. Ramaiah Institute of Technology (MSRIT) — *Bengaluru, India*
B.E. in Artificial Intelligence and Data Science | CGPA: 8.0 — *Expected 2027*
- Coursework: Deep Learning, Data Engineering, Digital Image Processing, Algorithms, Cloud Computing, NLP, Statistical Programming

Experience

Software Developer and Data Analyst Intern — *Apr 2026 – Aug 2026*
Benaka Electronics — *Bengaluru, India*
- Reduced steel-coil slitting plan calculation time from **15 minutes to 2 minutes** (approximately **87%**) by engineering a Python optimization workflow that converts customer orders into executable cutting plans.
- Improved material utilization and scrap outcomes while balancing order demand, inventory, and machine changeovers; modeled the cutting-stock problem using the Gilmore–Gomory formulation and Dantzig–Wolfe column generation with Google OR-Tools, GLOP, and CP-SAT.

Software / Security Testing Intern — *Aug 2025 – Dec 2025*
CMTI — *Bengaluru, India*
- Independently performed VAPT on **14 APIs** for an ongoing Tata Power plant project using Burp Suite and OWASP ZAP; documented **10 findings**, including **4 Critical-severity** issues.
- Reproduced and validated API security findings, capturing technical evidence to support remediation and security review.

AI/ML Intern — *Dec 2024 – Mar 2025*
Vrivia AI — *Bengaluru, India*
- Developed **GutBot**, an enterprise healthcare assistant for IOM Bio Works that supports patient queries and healthcare report analysis using retrieval-augmented generation (RAG) and AWS Bedrock foundation models.
- Implemented the RAG pipeline covering document ingestion, chunking, embeddings, retrieval, prompt engineering, and response generation; deployed a demonstration on Amazon EC2. See the GutBot repository.

Web Development and Software Management — *Jun 2024 – Apr 2025*
EmberQuest — *Bengaluru, India*
- Redesigned and validated the company website, improving its structure and consistency across the digital presence.
- Delivered an Internship Certificate Management System using Next.js, MongoDB, and NextAuth, automating PDF certificate generation and QR-code verification.

Projects

Skilvi – Learning Management Platform | ***NestJS, React, PostgreSQL, MongoDB, Razorpay, AWS*** Independent Project | Jul – Sep 2026 ↗
- Independently built and launched a live learning platform with **10+ enrolled users**, supporting learning content, dashboards, enrolments, learner support, certificates, and payments.
- Owned full-stack delivery across the React frontend, NestJS/Node.js services, PostgreSQL/MongoDB data layer, JWT/Google OAuth authentication, and Razorpay checkout.
- Managed AWS (IAM, SES), Vercel, and Cloudflare deployment, DNS, SSL, transactional email, and admin workflows for students, instructors, internships, and digital products.

Revkit – Open-Source Reverse-Engineering Platform | ***Python, Capstone, Keystone, Unicorn*** Open Source ↗
- Built binary-analysis capabilities for PE, ELF, Mach-O, and firmware, including disassembly across **10+ architectures**, control-flow and call graphs, cross-references, and C-like decompilation for x86, x64, and AArch64.
- Delivered a CLI, Python API, token-secured web application, Windows executable, plugin SDK, and batch-processing capabilities.
- Added vulnerability triage, hardening checks, secret and packer detection, and emulation-based unpacking; validated the platform with **85+ automated tests** and CI.

FusionQC – Injection Moulding Defect Detection | ***PyTorch, Transformers, DANN*** MSRIT ↗
- Developed a cross-modal Transformer and domain-adversarial neural network (DANN) pipeline combining thermal images, process curves, tabular machine data, and warpage images to predict **8 defect labels**.
- Applied group k-fold validation across **14+ designed setpoints** to prevent data leakage; used focal loss and threshold tuning for class imbalance, alongside Grad-CAM, a counterfactual setpoint recommender, and drift monitoring.

CUDA-Accelerated K-Means Clustering | ***C, CUDA, Python, NumPy*** Open Source ↗
- Implemented serial C and CUDA GPU K-means pipelines with k-means++ initialization; parallelized point-to-centroid assignment and cluster-sum accumulation using CUDA threads and atomic operations.
- Built Python benchmarking, profiling, CSV reporting, and visualization tools; on an NVIDIA Tesla T4, recorded up to **18**× speedup at 300K points and **14.1**× at 100K versus serial CPU (single runs).

Automated Options-Trading System | ***Python, Jupyter*** Client Project
- Delivered a client NSE options system using an existing EMA 22/33 crossover strategy, with historical NSE-data backtesting, paper-trading, and live modes.

Research Publications

- **FusioNet-DR** ↗: Diabetic retinopathy grading on APTOS 2019 using CORAL ordinal regression and CMAF attention fusion.
- **CBAM-CNN-BiLSTM** ↗: ECG arrhythmia classification on MIT-BIH using sparse multi-head attention and Grad-CAM interpretability.
- **STAMP-Net** ↗: Oral cancer histopathology classification using attention-based multiple-instance learning and adversarial stain disentanglement.

Certifications

Business Processes in SAP | S/4HANA Sourcing and Procurement | AWS Cloud Practitioner Essentials

Technical Skills

Programming Languages: Python, Java, JavaScript, TypeScript, C, SQL
Backend & Full-Stack Development: React.js, Next.js, Node.js, NestJS, Express.js, FastAPI, Flask, RESTful APIs, WebSockets, Authentication & Authorization
Databases: PostgreSQL, MongoDB, MySQL, Supabase, Firebase, Neon DB, Database Design, SQL Query Optimization
AI & Machine Learning: PyTorch, TensorFlow/Keras, Scikit-learn, Deep Learning, CNNs, BiLSTM, Transformers, RAG, OCR
Cloud & DevOps: AWS (EC2, IAM, RDS, SES, Bedrock), Docker, Nginx, Git, GitHub Actions, CI/CD, Jenkins, Azure DevOps, Vercel, Cloudflare, Linux
Optimization & Data Analytics: Google OR-Tools, Genetic Algorithms, Bayesian Optimization, Pandas, NumPy, Matplotlib
Core Computer Science: DSA, OOP, DBMS, Operating Systems, Computer Networks, System Design, Microservices Architecture
Systems & Security: Reverse Engineering, API Security Testing, Authentication & Authorization Testing, Vulnerability Assessment, Application Security