Kunal Mahato

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WORK EXPERIENCE

Virginia Tech, USA | Research Assistant   *June 2025 - September 2025*

- Built data-processing pipelines for LLMs in Python integrating OpenAI, Llama, and Gemini APIs through implementation of data-selection strategies including seed-based, embedding-based, alongside domain expert in the loop for ~1k records.
- Developed retrieval system for RAG with PyTorch + SentenceTransformers to perform top-K selection, improving relevance and recall, and achieving up to ~80% F1 in classification tasks.
- Automated reporting with Pandas/NumPy, producing results across 12 model × label setups and reducing run time by 3x.

Turvo Inc, India | Software Engineer   *May 2021 - June 2023*

- Enhanced global search and filter efficiency by 10% through advanced Elasticsearch indexing and GraphQL API implementation, improving data retrieval speed and accuracy for supply-chain operations.
- Led the development and integration of a new Intermodal mode, migrating 216k+ shipments via Python scripting, ensuring robust data consistency across MySQL and MongoDB databases.
- Managed reorganization of the Rules Framework with a Business Rule Management System built as Spring Boot microservices to support role-specific shipment locks and mode-based status sequences, enhancing reliability for 10+ clients.
- Built Jenkins CI/CD pipelines for isolated dev setups, cutting deployment time by 40% and improving release reliability.
- Automated secrets management via HashiCorp Vault for 10 clients, enabling API-key rotation & credential injection.

Samsung, South Korea | R&D Engineer   *December 2019*

- Integrated backend UI components in Java using Android Framework with system services for foldable-specific notifications, contributing to the global launch of the world's first foldable phone at Samsung HQ.

Samsung, India | R&D Engineer   *June 2018 - April 2021*

- Maintained and optimized full-stack codebase for 5 OS iterations, enhancing performance for 1.48+ billion devices.
- Optimized low end devices, System UI (Quick Panel & Notifications) in Java, cutting memory use 20% and battery drain 20%, reducing crash rate 85% and boosting user satisfaction to 4.4/5 across 1M+ devices.
- Handled 5 Application and Framework modules - Settings, Calendar, QuickPanel, Status-Bar and warning notifications.
- Upgraded the customer satisfaction metrics by 10% through implementation of Search feature for Quick Panel.
- Collaborated cross-functionally with teams to build backend data-porting solutions integrating 20+ network operators.

EDUCATION

Virginia Tech   Virginia, USA
Master Of Engineering in Computer Science & Applications - GPA: 3.93/4   *August 2023 - May 2025*
Motilal Nehru National Institute Of Technology Allahabad (NIT Allahabad)   Prayagraj, UP, India
Bachelor Of Technology in Computer Science & Engineering - GPA: 3.53/4   *July 2014 - May 2018*

PROJECT EXPERIENCE

U-Pass Manager | Virginia Tech | GitHub | Demo | VTechworks   *January 2025 - May 2025*

- Architected Kubernetes-managed Next.js, React, Node.js web app, ensuring 99.9% uptime for 10K+ student records.
- Cut manual entry 95% with AWS Lambda automating S3 to RDS ingestion and boosted pickups using SES notifications.
- Improved API speed 50% and secured role-based access via optimized GraphQL/REST endpoints (Express, Apollo, JWT).
- Halved student wait times with a 100 ms NFC validation pipeline using Socket.IO for real-time distribution.

LifexAI | Bitcamp-Hackathon of University of Maryland | GitHub | Demo   *April 2025*

- Built LifexAI - AI detective web app integrating Google Gemini Vision API, Capital One Nessie API, and real-time Chart.js dashboards with Tailwind CSS and Framer Motion, boosting anomaly detection accuracy by 30%.
- Accelerated data loading 50% with Typescript React Query caching & Next.js APIs on Cloudflare Workers.
- Ensured 99.9% uptime and global delivery via Vercel-hosted frontend and automated CI/CD with Docker.

DoDEx (Winner for People's Choice Hack) | Bitcamp-Hackathon of University of Maryland | GitHub | Devpost   *April 2024*

- Engineered an AI parser using Python with LLM + RAG, improving Defense Contract validation accuracy by 30%.
- Developed a web scraping and validation pipeline in Python, extracting and categorizing key contract data, and enhancing accuracy through few-shot prompting and schema validation with Pydantic.

SKILLS

Programming Languages and Databases: Java, Python, Go, C++, JavaScript, PostgreSQL, MongoDB, MySQL.
AI & Machine Learning: LangChain, LLMs, RAG, PyTorch, SentenceTransformers, TensorFlow, Pandas, NumPy, Streamlit.
Frameworks and Technologies: React, Angular, Next.js, TypeScript, GraphQL, Spring, Node.js, Express, FastAPI.
Cloud & DevOps: AWS(Lambda, IAM, VPC, Cloudwatch, EC2, S3, EMR, SageMaker, API Gateway), Docker, CI/CD.
Tools & Platforms: Git, Figma, JIRA, IntelliJ, Kibana, UNIX, Perforce/P4V.