Ayush Madhav Kumar

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Education

University of Michigan **Aug 2025 – May 2028**
Bachelor of Science in Computer Science; Minor in Business and Mathematics *Ann Arbor, Michigan*

Experience

NASA CLAWS **September 2025 – Present**
Artificial Intelligence Engineer *Ann Arbor, Michigan*

- Engineering CORVUS, a dual inference AI assistant for NASA SUITS and RASC AL, integrating lightweight transformers (TinyBERT) on Jetson Orin Nano via ONNX Runtime for sub 350 ms inference, including troubleshooting deployments
- Designing an edge cloud architecture that routes inference based on query complexity, latency, and network state
- Implementing DSPy based orchestration and Pydantic validated NLP pipelines within Unity Inference Engine
- Integrating WebSockets and Whisper based preprocessing to synchronize telemetry in high noise environments

Patch **June 2025 – August 2025**
2025 Cohort Founder *Dublin, Ireland*

- Built a startup in 7 weeks as part of the Patch Summer Accelerator, leading end to end technical development
- Offsited at Stripe Dublin and Developed the mobile frontend using React Native, optimizing UI responsiveness and UX
- Implemented a scalable backend with Django and PostgreSQL to manage health data, authentication, and notifications

GIIT Solutions **June 2024 – July 2024, April 2025**
Associate Software Intern *Remote*

- Engineered CI CD pipelines using GitHub Actions on AWS, automating deployments and improving reliability
- Developed Python scripts to streamline backend processes, reducing manual overhead
- Collaborated with senior developers to optimize cloud infrastructure for cost efficiency
- Deployed cloud native solutions with AWS CI CD, improving scalability and uptime

Projects

Real Time Task Management Platform

- Engineered a full stack system enabling users to create, update, and track tasks with sub second updates
- Built Django REST APIs for CRUD operations and secure authentication workflows
- Integrated MongoDB for dynamic user data storage and efficient logging and implemented React interface for the frontend

Machine Learning Model Serving Microservice

- Developed a backend microservice to host and serve ML models through Flask REST APIs
- Handled asynchronous inference requests using RabbitMQ for scalable task queuing
- Persisted model outputs and user queries in MongoDB for analytics and audit logging and containerized system using Docker

Achievements

- Top 10 in the Irish Mathematical Olympiad, shortlisted for the national IMO team
- Top 25 in the Irish Chemistry Olympiad, recognized by the Royal Society of Chemistry
- Co-Chaired of an International Model United Nations
- Open Source Contributor to Meta: Pytorch and React

Technical Skills

- **Programming Languages:** Python, JavaScript, TypeScript, Java, C, C++, Ruby, PHP, SQL, HTML, CSS
- **AI and ML:** PyTorch, TensorFlow, JAX, HuggingFace Transformers, ONNX Runtime, Scikit learn, OpenAI APIs, LLMs, NLP, Computer Vision, Reinforcement Learning, Edge AI deployment, Model optimization
- **Software Development:** React, Next.js, React Native, Node.js, Django, Flask, FastAPI, REST, GraphQL, Flutter, Dart, WebSockets, Progressive Web Apps, Vue, Git, GitHub, GitHub Actions, GitLab, APIs
- **Databases and Data Engineering:** MongoDB, PostgreSQL, Redis, MySQL, Data modeling, ETL pipelines
- **DevOps and Cloud Infrastructure:** Docker, Kubernetes, CI CD pipelines, RabbitMQ, Linux, AWS EC2, AWS Lambda, AWS S3, Google Cloud, Edge deployment, Serverless architecture, Scalable ML inference orchestration
- **Cybersecurity:** Nmap automation, PCAP forensics, TLS protocol analysis, API and web vulnerability analysis, reverse engineering, YARA based malware triage, cryptographic weakness detection, AWS IAM and S3 security
- **Core Computer Science:** Data Structures, Algorithms, Time and Space Complexity Analysis, Object Oriented Design, Memory Management, Concurrency and Multithreading, Operating Systems Basics