JASPER CANTWELL

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PROFESSIONAL SUMMARY

Full-stack software engineer with 2+ years building scalable, production-ready systems for AI/ML platforms. I combine cloud-native architecture expertise (AWS, microservices, event-driven design) with modern web technologies (React, TypeScript, Python, FastAPI) to deliver complex services from concept to production. My physics background sharpens my analytical and problem-solving approach, while my passion for sustainable innovation drives me to build software that tackles real-world challenges. From uncertainty quantification for ML workflows to connecting the global bikepacking community.

TECHNICAL SKILLS

Cloud & DevOps: AWS (ECS, Lambda, SQS, S3, EC2, ECR, CloudFront, Route53, SES, CloudFormation, Cognito, CloudWatch), Docker, GitHub Actions, CI/CD pipelines, Infrastructure as Code
Backend Development: Python (FastAPI, Pydantic, Pytest, Celery), RESTful APIs, Microservices Architecture, Event-Driven Systems, API Design, Authentication & Authorisation
Frontend Development: JavaScript/TypeScript, React, Next.js, Vite, Zod, Mapbox, Static Site Generation, OpenAPI Client Generation
Machine Learning: PyTorch, BoTorch, Scikit-learn, Pandas, NumPy, Gaussian Processes, TensorFlow, Neural Networks, Uncertainty Quantification, LangChain Agents, RAG Pipelines
Databases: MongoDB (including GeoSpatial queries), Redis, Database Schema Design
Development Practices: Agile/Scrum methodologies, Git/GitHub, Jira, Code Review, Technical Documentation, Team Mentorship

PROFESSIONAL EXPERIENCE

Software Engineer
digiLab — AI Technology Startup
September 2023 - June 2025

- Core product team engineer building a machine learning workflow platform from the ground up, working in a fast-paced startup environment to deliver production-ready systems.
- Selected for a scout team with the CEO, CTO, and lead architect to design our long-term event-driven microservice architecture—enabling modular development that helped data scientists contribute 100% faster.
- Transformed CTO's LangChain prototype into a production-ready, cloud-native no-code AI platform. Built agentic RAG workflows for nuclear engineers and AI triage systems for healthcare company KOYO. Implemented comprehensive error handling, robust state management across agent interactions, and APIs designed to handle unpredictable LLM outputs gracefully.
- Rapidly brought a complex microservice from concept to production in 2 months despite shifting requirements, implementing token-based authentication (AWS Cognito), user analytics (CloudWatch), and scalable event-driven patterns.
- Designed, deployed, and maintained AWS-based infrastructure using Docker containers, CloudFormation templates, and automated CI/CD pipelines (GitHub Actions), reducing developer time spent on deployment by 99%.
- Extended our internal machine learning library with Gaussian Process models using PyTorch and BoTorch, improving uncertainty quantification accuracy for production ML workflows.

- Helped onboard graduate hires and consistently received positive feedback for being approachable and supportive; delivered knowledge-sharing presentations to help the team level up.
- Provided direct product support to internal and external clients, ensuring successful demos and smooth adoption.
- Served as the employee association representative, leading discussions on workplace improvements with the founders. Secured office amenities, approved time for internal AI seminars, and helped form an internal AI ethics committee.

PROJECTS & CURRENT WORK

During my ongoing bikepacking journey from England to Bangladesh, I've been building and deploying software projects inspired by the trip. These demonstrate my love for software development and ability to apply my skills to solve real-world problems.
findkairos.com – Full-stack web application for connecting bikepackers worldwide.

- Built scalable backend using Python FastAPI with MongoDB (leveraging GeoSpatial indexing for location-based queries), deployed as serverless functions on AWS Lambda.
- Developed responsive frontend with Next.js and Mapbox integration, statically hosted on AWS (S3 + CloudFront) for optimal performance.
- Implemented automated OpenAPI TypeScript client generation that publishes to npm when a new backend version deploys, ensuring type-safe API consumption.
- Designed secure token-based authentication system and scalable database schema supporting complex user journey tracking.

jaspercycles.com – Personal project tracking my bikepacking journey in real time.

- Developed React + Vite frontend that integrates with the Strava API to record my progress as I cycle.
- Deployed as static site on AWS infrastructure (S3 + CloudFront) with automated deployment pipeline.

ADDITIONAL EXPERIENCE

Research Intern – GPU Programming for Quantum Spin Dynamics
University of Exeter
Summer 2022

- Developed optimised Python package for GPU-accelerated matrix exponent calculations using CUDA, achieving a 60% performance improvement in quantum dynamics simulations running on HPC infrastructure.
- Gained understanding of low-level GPU programming through CUDA kernel development and CuBLAS library integration—refreshed my C knowledge in the process.
- Learned GPU optimisation techniques for numerical computing applications.

EDUCATION

Master of Science in Physics
University of Exeter — Upper Second-Class Honours (2:1) — Average: 69%
2019 - 2023
Master's Thesis: The Application of Machine Learning to the Inverse Scattering Problem

- Conducted independent research applying machine learning to inverse scattering problems, building neural networks with TensorFlow and gaining practical insights into the challenges of applying ML solutions to real-world problems.
- Strengthened Python proficiency and numerical methods expertise by creating a smooth particle hydrodynamics simulation in a computational physics module.
- Opted for modules emphasising theoretical and computational physics, greatly developing my mathematical modeling, critical thinking, and analytical problem-solving skills.