Ashkan Shokri, PhD

Summary

A Machine Learning Engineer with a Ph.D. and 8+ years of experience building and shipping robust, end-to-end ML systems for critical, high-stakes domains. Proven expertise in developing **decisioning and optimisation models** on large-scale data, underpinned by strong software engineering fundamentals including **testing, CI/CD, and operational ownership**. Seeking to define and build the machine learning strategy within the Global Payments team, leveraging skills in **Python**, **PyTorch**, and building reliable systems to improve revenue outcomes and user experience on Canva's payments platform.

Key Skills

- **Languages: Python** (Expert), **SQL**
- **Machine Learning: Decisioning Systems**, **Supervised Learning**, **Optimisation**, Deep Learning (**PyTorch**), Scikit-learn, Anomaly Detection
- **MLOps & Software Engineering: End-to-End System Design**, **CI/CD**, **Testing**, **APIs**, **Docker**, **Azure**, Operational Ownership

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Professional Experience

CSIRO, Melbourne, Research Scientist | Applied ML 01/2023 – Present * Architected and delivered a **production-ready Python package** for a national-scale forecasting system, establishing a high standard for software quality with a **plugin-based design, 90%+ test coverage, and full CI/CD automation**. This demonstrates strong **operational ownership** and fundamentals. * Shipped an **end-to-end PyTorch-based LSTM model** for streamflow forecasting, from feature design and training to evaluation and monitoring, improving accuracy by 20% over baselines in a complex, noisy data environment. * Engineered a **scalable data pipeline on Azure** that processed over 2 million simulations, showcasing experience with large-scale data systems. * Designed and built a **real-time data quality control product** to monitor and ensure

reliability for national water data streams, analogous to fraud and integrity systems in a payments context.

Bureau of Meteorology, Melbourne, Senior Data Scientist (Hydrologist) 09/2018 – 01/2023 * Developed and operationalized a **Random Forest-based anomaly detection system** as a core component of a **high-stakes national product**. This decisioning system identified critical infrastructure risks from over 1 million data points with 70% accuracy. * Led the scientific development and owned the operational performance of Australia's national hydrological model, a critical data product serving thousands of users daily. * Drove a 30% accuracy boost in the Australian Fire Danger Rating System by building and integrating a new **ML forecasting model**, demonstrating the ability to ship ML that measurably improves a critical system.

Monash University, Melbourne, Developer 12/2019 – 06/2020 * Built a **Python API** for real-time water market simulations, automating decision modeling with eWater SOURCE. * Developed an automated tool for assignment generation, saving 300+ hours of manual processing.

Side Projects

Deep Focus Timer: Full-Stack Productivity Web Application 06/2025 - present * Built a **full-stack productivity timer** with **Next.js** (**TypeScript**, **React**) frontend and **Python** backend using **Vercel serverless functions**, **PostgreSQL** (**SQLAlchemy** + Alembic). * Features include task CRUD, prioritization, session tracking, and secure user authentication with **Clerk**. * Implemented **CI/CD pipelines**, automated testing (**Jest**, React Testing Library, **Pytest**), and deployed on **Vercel** for production-ready reliability. * https://deepfocus-inky.vercel.app/

HydroGet, Solo Developer: Automating RORB Hydrological Modelling 09/2024 - present * Designed and developed a **web application** to automate the process of RORB calibration. Enhanced efficiency by reducing manual adjustments and minimizing errors in hydrological modelling workflows. * Technology stack used: **Azure serverless functions**, PyRORB, **FastAPI**, **Next.js**. * Released an early prototype and collected user feedback to refine functionality and improve user experience.

Education

- **Doctor of Philosophy**, Civil Engineering, Monash University, Melbourne, Australia, 2019
- **Master of Engineering**, University of Tehran, Iran, 2011
- **Bachelor of Engineering**, University of Tehran, Iran, 2009

Research

- 20+ peer-reviewed publications, 590+ citations, h-index 11.
- 20+ international conference presentations, 3 book chapters, 4 technical reports.
- Supervised 8 students, including 2 final-year projects, 5 master's students, and 1 PhD student.
- Reviewer of NeurIPS 2025 Climate Change AI (CCAI) Tutorials Track and journal papers on machine learning for hydrology, including Hydrology & Earth System Sciences, Journal of Hydrology, and Environmental Modelling & Software.

Selected publications

- Shokri, A., Bennett, J. C., Robertson, D. E., Perraud, J.-M., Frost, A. J., & Lehmann, E. A. (2025). Better continental-scale streamflow predictions for Australia: LSTM as a land surface model post-processor and standalone hydrological model. EGUsphere.
- Lester, R., Robertson, D., Bailey, J., Dwyer, G., Holt, G., Jalilov, S., Shokri, A., & Watto, A. (2025). Synergistic outcomes for water availability, the environment and economic output under climate change and adaptation. Nature Sustainability.