Dr. Kaan Demir

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https://scholar.google.com/citations?user=5uEaJosAAAAJ&hl=en/

Professional Profile

Senior data and AI expert with over 7 years of combined experience spanning government, consulting, and academic sectors. Deep knowledge of AI from an academic perspective with practical delivery of cloud-native, production-ready solutions in consulting/public sector scenes. Proven in leading client-facing, high-impact AI projects from concept to deployment, driving innovation and responsible governance.

Core Competencies

- **AI Engineering & Fine-Tuning**: RLHF, SFT, PPO, DPO, deliberative alignment, guardrails, Chain-of-Thought (CoT) for policy compliance
- **LLMs & Advanced AI**: AutoGen, LangChain, Agentic AI, RAG, NER, LoRA, Transformers, PyTorch
- **Cloud & DevOps**: Azure App Services, Databases, Storage, AI Foundry, Infrastructure-as-Code
- **MLOps & AI Governance**: ISO 42001, Responsible AI frameworks, model lifecycle management
- **Data Engineering**: ETL/ELT, Star Schema, SQL, pipeline optimisation
- **Software Development**: Python, Java, R, Pandas, REST APIs, asynchronous programming, front-end and back-end integration (React, TS, Next.JS, Streamlit)
- **Leadership & Strategy**: Project planning, stakeholder engagement, ROI modeling, Agile/PRINCE2
- **Research & Thought Leadership**: 10+ publications in internationally recognised AI venues

Experience

AI & Data Engineer ***DataSing*** 2025 – Current

- **End-to-end Solution Lead**: Delivered end-to-end AI PoCs and MVPs for enterprise clients, covering frontend, backend, Azure provisioning, DevOps, and MLOps.
- **Agentic Automation**: Engineered asynchronous backend job orchestration, reducing analysis time from months to hours through agentic AI frameworks.
- **Front-End Integration**: Delivered secure, client-facing LLM applications using React/TypeScript and Streamlit, integrated with Azure App Services.
- **Solutions Architecture**: Designed ingestion pipelines with Infrastructure-as-Code, security, and compliance principles.
- **Governance & Alignment**: Contributed to ISO 42001 research and implemented deliberative alignment and Chain-of-Thought (CoT) reasoning for policy compliance.
- **R&D Leadership**: Standardised internal frameworks for automated coding agents, reducing development cycles by 70+%.
- **Client Management**: Supported client engagement, scoping, and technical presentations-recognised by leadership and clients for professionalism and clarity.

Data Analyst (AI & Strategic Projects Lead) *Financial Intelligence Unit, New Zealand Police* 2024 – 2025 (18 Months)

- **LLM Applications**: Prototyped retrieval-augmented generation (RAG) solutions using LangChain and HuggingFace for legislative ingestion.
- **ETL Optimization**: Led large-scale ETL performance improvement initiative across mission-critical pipelines.
- **Governance**: Designed governance frameworks for NLP models, incorporating responsible AI principles and compliance guardrails.
- **Strategic Delivery**: Managed end-to-end solution lifecycle from business case to proof-of-concept, leveraging MLOps platforms (DataRobot) for deployment.

- **Stakeholder Engagement**: Presented AI strategy to senior leadership, influencing digital transformation and infrastructure investment.
- **Senior Leadership Engagement** - Presented strategic insights to governance groups, impacting digital transformation.
- **Business Case Development** - Led a cost-benefit and return on investment analysis that informed a business case for AI infrastructure investment.
- **Cross-Sector Partnership** - Brokered a strategic partnership with ESR to enable high-performance computing for the FIU.

Senior Machine-Learning Researcher *Victoria University of Wellington, School of Engineering and Computer Science* 2021 – 2024 (Full Time)

- **State-of-the-art Machine-learning and AI** - Designed custom transformers, self-attention mechanisms, multi-variate optimisation methods, and disentangled autoencoders for various state-of-the-art methods in AI research.
- **State-of-the-art Representation Learning** - Designed and implemented evolutionary learning approaches for structured multi-label data representations.
- **Independent Research Leadership** - Managed full research lifecycle including planning, experimentation, and thesis development.
- **AI Research Leadership** - Published 12 papers in top AI venues; contributor to OpenReview discussions for ICLR, ICML, IJCAI, AAAI; reviewer in top venues such as TEVC, TKDD, GECCO.

AI & Data Science Researcher *Victoria University of Wellington, School of Engineering and Computer Science & School of Mathematics and Statistics* 2021 – 2024 (Contract)

- **Leading Applied AI Research**: Led applied AI research for multi-agency projects, including genetic algorithm-based feature selection for marine biomass analysis.
- **Cross-Sector Collaboration**: Coordinated research with Callaghan Innovation and New Zealand Plant & Food Research.

Head Graduate Teaching Assistant *Victoria University of Wellington, School of Engineering and Computer Science* 2020 – 2024 (Contract)

- **Course Management**: Managed and trained 30+ tutors; standardised marking and teaching processes across courses.

AI & Data Science Researcher *Victoria University of Wellington, School of Mathematics & Statistics* 2018 – 2019 (Contract)

- **Statistical and Data Analysis** - Performed analysis of data using traditional statistical and data science methods.
- **Research Assistant** - Implemented analysis methodology and generated experiments for output to aid in research.

Education

Victoria University of Wellington, PhD (Computer Science & Artificial Intelligence) 2021–2024

- **Thesis:** Evolutionary Representation Learning of Structured Multi-label Data

Victoria University of Wellington, Honours (Computer Science & Artificial Intelligence) 2020–2021

Victoria University of Wellington, Bachelor of Science (Computer Science & Artificial Intelligence) 2017–2019

Selected Publications

- K. Demir, B. H. Nguyen, B. Xue and M. Zhang, "Multi-Label Black-Box Attacks via Evolutionary Structured Many-Objective Adversarial Perturbations," in IEEE Transactions on Evolutionary Computation, 2025.
- K. Demir, B. H. Nguyen, B. Xue and M. Zhang, "Dual Sparse Structured Subspaces and Graph Regularisation for Particle Swarm Optimisation-Based Multi-Label Feature Selection," in IEEE Computational Intelligence Magazine, 2024.
- K. Demir, B. H. Nguyen, B. Xue and M. Zhang, Co-operative Co-evolutionary Many-objective Embedded Multi-label Feature Selection with Decomposition-based PSO,. In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO '23).

References

References are available upon request.