

Education

BSc (Honours) in Data Science & Artificial Intelligence, *University College Cork*, Ireland

Experience

Oct 2025 – **Undergraduate Researcher**, *Insight SFI Research Centre for Data Analytics*, Ireland

- Present ○ Contributing to the ToolBrain collaboration (UCC, UCD, IBM) on reasoning-driven AI and autonomous tool-use
- Exploring mechanisms for autonomous systems to reason, plan, and interact with complex tool environments

Jun–Aug 2025 **Web Development Intern**, *University College Cork*, Ireland

- Built a unified booking system for library spaces/equipment, collapsing multi-page flows into a single optimized flow
- Implemented a FastAPI proxy for JSON transformation and third-party API integration; deployed the stack on Google Cloud

Projects

HERMES: Hybrid Exoplanet Recognition and Multi-planet Extraction System

Python, JAX, Flax, Gin-Config, Abseil, NumPy, Astropy

- Designed a hybrid exoplanet detector from light curves, combining transformer models with physics-based orbital checks
- Built reproducible JAX/Flax training & inference (Gin/Abseil) with deterministic evaluation and checkpoints
- Achieved ~5 ms inference per light curve and 70% validation accuracy

MiniGrad: Reverse-Mode Autodiff Engine

Python, PyTorch, MLflow, Docker, PyQt

- Implemented a compact PyTorch-style autodiff engine with reverse-mode differentiation, broadcasting support, dynamic computation graphs, and a minimal neural-network layer API

High-Performance Text Summarizer

Flan-T5, JAX/Flax, XLA jit/pmap, Mixed Precision, Google Cloud TPU

- Optimized Flan-T5 fine-tuning on TPUs by implementing XLA JIT compilation, mixed precision, and sharded inputs
- Designed a containerized Google Cloud (GKE/TPU) deployment architecture with a high-throughput streaming data pipeline for low-latency APIs

Multilingual AI Chatbot

Python, PyTorch, MLflow, Docker, PyQt

- Developed a multilingual (English/Ukrainian) intent-classifier chatbot with PyTorch, containerizing the MLOps workflow with Docker and CI/CD via GitHub Actions

Extracurriculars

Jan–Oct 2025 **Avionics ML Engineer**, *UCC Rocketry*, Cork, Ireland

- Architected two foundational computer vision models (modified Faster RCNN & Pyramid Vision Transformer)
- Engineered a complete MLOps pipeline, leveraging transfer learning (xView, DINOv2) and reducing model deployment time by 40%

Oct 2024 **Team Leader**, *Microsoft Cybersecurity Hack 2024*, Dublin, Ireland

- Led a team to secure 3rd place (out of 10) by identifying and presenting critical vulnerabilities in an Azure Database security assessment

Skills & Technologies

Programming Python, C/C++, Java, Go, Rust, Bash

ML PyTorch, TensorFlow, JAX/Flax, Transformers, NumPy, Pandas, Scikit-learn, XGBoost, MLflow

System & DevOps PostgreSQL, MySQL, SQLite, MongoDB, Docker, Kubernetes, AWS, GCP, GitHub Actions, Colab, FastAPI, Flask, Django, REST APIs, HTML/CSS/JS