Thomas Marshall

Machine Learning Engineer (BEng, MSc)

Goal-driven machine learning engineer, with a Bachelor's degree in computer engineering and a Master's degree in applied mathematics. Experience with major machine learning frameworks (PyTorch, JAX and TensorFlow). Energised by the prospect of developing disruptive new machine learning solutions in industry.

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SKILLS

Python	**TensorFlow**	**Linux**	**Leadership**
PyTorch	**C and C++**	**Embedded hardware**	**Team work**
JAX	**LaTeX**	**Systems engineering**	**Requirements analysis**

EDUCATION

MSc (Machine Learning and Artificial Intelligence) with distinction

🏛 Stellenbosch University   📅 2022   📍 Stellenbosch, South Africa

Research Project

I researched learning variational state space models for vision-based robot control; specifically variational recurrent neural networks with inductive priors that produce embedding spaces that are easy to use for control. I explored fundamental limitations in this class of model and identified avenues for future research in this field.

Supervisors:
- Prof. Steve Kroon (Stellenbosch University, Computer Science)
- Dr Michael Burke (Monash University, Electrical and Computer Systems Engineering)

Coursework

- Mathematics for Machine Learning
- Foundations of Deep Learning
- Probabilistic Modelling and Reasoning
- Applied Machine Learning at Scale
- Computer Vision
- Monte Carlo Methods
- Advanced Probabilistic Modelling
- Optimisation for Machine Learning
- Reinforcement Learning and Planning
- Natural Language Processing

BEng (Computer Engineering, 4 Years)

🏛 University of Pretoria   📅 2018 – 2021   📍 Pretoria, South Africa

I focused on using machine learning to identify typical radio-frequency signal types in real-world signal environments. My hardware solution used low-cost software-defined radios to capture signals. I implemented a convolutional neural network from scratch in Python to train a signal classifier on real signal data I collected. I used TensorFlow to prototype different models. This system also used CUDA for GPU acceleration.

EXPERIENCE

Engineering Internship

🏢 Hensoldt GEW   📅 2021 – 2021   📍 Pretoria, South Africa

I oversaw the development of an automated testing system for direction finders. The Automated Direction Finder Test Platform, or ADFTP, was a project that used a wireless mesh network of embedded systems equipped with radio transmitters to simulate various radio targets at predetermined locations. Python, Java, C++, Linux, software-defined radio, and embedded hardware platforms were all used throughout my work on this project. I also went to a systems engineering masterclass and a short course on micro-soldering employed at GEW.

OTHER ACTIVITIES AND PROJECTS

Community-based project

🏢 Volunteer work   📅 2019   📍 University of Pretoria, South Africa

I was in charge of a group that fixed outdated computers and gave them to a high school in need in the area. The goals of inclusive computing and education guided our service.

AWARDS

Won Capitec Bank Data Science Hackathon 2022

My multidisciplinary engineering team participated in the Capitec Bank Data Science Hackathon. Our solution, which forecasted customer behaviour using financial data, took first place.