

# Maxwell Clarke

## BACKGROUND

I'm a software developer with professional interests in AI Alignment and distributed database systems. I recently completed a Master's thesis in machine learning — training and applying transformer models.

In my free time, I enjoy building my own programming language using Rust, rock climbing, and dabbling in game development with the Godot game engine.

I participate in Effective Altruism, a social movement which asks how we can do the most good for the world with our resources. I aim to use my career to help solve the world's most pressing problems, especially the AI Alignment problem.

## PROJECTS

### Master's Thesis

Experiments with a modified transformer architecture which uses a cross-attention layer to specify which output(s) to predict at each iteration. This task is more challenging to learn than plain sequence prediction, but the resulting model can be used for "order-independent" autoregressive generative modelling, which I hypothesize is useful for tasks that don't have a natural linear order (eg. pixels in an image or joint angles in a skeleton).

### Kal Language

My own programming language. It is a dynamic language with an effect system, developed in Rust, with plans to compile to WebAssembly.

### ThisPPL

A custom implementation of the probabilistic programming language described in Introduction to Probabilistic Programming (van de Meent et al. 2018), including an evaluator using a Metropolis-Hastings variant.

### Interpretability experiments

My attempt at implementing the interpretability techniques from Distill's Feature Visualization.

## EDUCATION

### 2020 - 2022

**Master of Science** in Computer Science.  
Victoria University of Wellington, Wellington, NZ.

### 2015 - 2018

**Bachelor of Science** in Computer Science.  
GPA 8.15 (A/A+ average).  
University of Canterbury, Christchurch, NZ.

## EXPERIENCE

2019 - 2020

**Software Developer**, Intranet Consulting, Christchurch.

Intranet is a small consulting company which does bespoke software development. During 2019 and 2020, I worked on: A blockchain data analysis project, a crypto token integration project, workflow web apps for Ryman Healthcare, and a machine learning project for live traffic counting.

2017 - 2018

**Junior Software Developer**, Intranet Consulting, Christchurch.

Full-stack web development for Cryptopia, a Christchurch-based cryptocurrency exchange. During their period of rapid growth, I worked on improving their web platform using JavaScript, .NET/C# and SQL Server.

2015 - 2016

**Intern Software Developer**, Verizon Connect, Christchurch.

Verizon Connect (formerly Telogis) is a US-based Vehicle Telematics provider. I was a full-stack web development intern for the Customer Tools team. I worked full-time during the summer, then continued part time.

## SKILLS

### Programming Languages

Python  
Rust  
C# / .NET  
TypeScript  
HTML / CSS / JS

### Web Development

PostgreSQL  
SQL Server  
Vue.js  
ReactJS

### Machine Learning

Jupyter  
Numpy  
Tensorflow  
Pytorch  
Transformers

### DevOps

Kubernetes  
Git  
Docker  
Linux  
Jenkins  
Ansible

## CONTACT



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