

**Last updated:** May 22, 2020

**Original copy (in case broken):** <https://mullikine.github.io/cv/>

# 1 Shane Mulligan; BSc (Computer Science)

## 1.1 Cover Letter

To my prospective employer,

Please consider me for this role.

My dream job is a Language Engineer; essentially, creating DSLs to interface with Natural Languages. I have been in the workforce as a software developer for about 10 years. I have been programming for around 20. I am an expert at scripting languages, particularly python and proficient at many other languages, including Haskell. I am experienced with microservices; I've used AWS, Kubernetes and Google Cloud. I am a scientific programmer; I can research, create quality documentation, design and automate experiments. I'm keeping up-to-date with the latest technologies and have a blog where I talk about the things I'm learning. I have been building my own learning environment with UNIX tools since 2010. I have my BSc in Computer Science. I also have experience in creating and debugging automated tests for "Hardware In the Loop". I have work experience and open source experience in Golang, C++, and emacs lisp. My style is language agnostic; I easily pick up new languages, file formats and tooling. I build and integrate AI-assisted programming tools (See the link below). I'm a very strong emacs user and I have a blog where I talk about plugins I have made and the things I learn about. In 2019 I automated a pipeline to scale a platform for automating pull requests to GitHub. In 2020 I contracted for FMG in Australia developing part of their CI/CD infrastructure for their vehicle Autonomy team. I have been using Ubuntu Linux for the last 10 years; I am as knowledgeable as they come with regard to dealing with linux. I am, however setting my sights on NixOS and have started migrating. I studied Information Retrieval at postgrad level and have built my own code search engine. I am very capable and hard working.

Thank you for your consideration,  
Shane Mulligan

## 1.2 Links

- <http://mullikine.github.io> - Daily Blog
- GitHub, gists, List of most active users in GitHub - GitHubStats

## 1.3 Past CVs

This is here to communicate my background but not my direction.

- CV and written reference - 2015 - Application for C++ Development

## 1.4 Work experience

### 1.4.1 Fortescue Metals Group (contract)

**job title** Senior Software Tester and Tooling

**Job Application** Application to Fortescue Metals Group // Bodacious Blog

<https://www.cncf.io/>

technology	context
gitlab-ci	CI pipeline with own runner on AWS
docker	tooling
shell	deployment
ROS2	static analysis, linting
AWS	packaging and deployment

- Splunky Splog - Nonsensitive work-related blog

started Jan 2020

ended May 2020

### 1.4.2 CodeLingo Ltd

**job title** Software Engineer (contractor)

Development / automation

Golang, bash, kubernetes

1. Examples of pull requests generated and made automatically

These pull requests were generated by the automated CodeLingo platform.

<https://gist.github.com/1860bf2a2a9e1e3b3bbb96b95a11bdd0>

**started** Sep 2018

**ended** May 2019

2. Languages used

language	context
golang	Built the Gometalinter lexicon
shell	Pipeline
python	GitHub API
ElasticSearch Lucene	Debugging
BigQuery standard SQL	GHTorrent / Bigquery for Github
JavaScript	Unit testing
emacs lisp	Building an environment for a new language (CLQL)

3. Highlights

- 0 to 1000 automated github pull requests over 8 months.
- Pipeline outreach scaled the platform from 10 to 300 app installs.

### 1.4.3 Crown Equipment Corporation

**job title** HIL (hardware-in-the-loop) Test Engineer

Continuous integration.

Embedded c/c++.

**started** Jan 2015

**ended** Sep 2017 (2 years 8 months)

1. primary languages used

- C++13
- python

2. Responsibilities

- HIL (hardware-in-the-loop) rigs / integration tests
- Implement driver for 3D Basler Camera

3. Highlights

- Built a platform for correlating error messages with logs and code using the the Sphinx open source search engine.

#### 1.4.4 TracMap

**job title** Software Engineer

Embedded programming

Full-stack web development

**started** Jan 2011

**ended** Mar 2013 (2 Years 2 months)

1. primary languages used

- C++
- python
- javascript
- postgresql

2. Highlights

- Ported the firmware from the older TM4 head units to the then prototype TM5 headunit.

3. Images

- 2012: TM4 needs love
- 2019: First TM5 returns home

### 1.5 Open-source Projects

#### 1.5.1 Age of Kings Trigger Studio

<http://aok.heavengames.com/blacksmith/showfile.php?fileid=12103>

The most popular Age of Empires II scenario editor. Downloaded 11,000 times since 2014. Used in making campaigns for Age of Empires II HD edition and expansions.

Software	Purpose
IDA Pro	Reverse engineering
Visual Studio 2005	Compiling
emacs/vim	Programming

### 1.6 Skill set

- Language agnostic / polyglot
- Prefers autonomy/ self-management
- Continuous learning
- I do everything inside a terminal (and I make it look good)
- Prefers automation in almost every situation

### 1.7 Education

Degree	Field	Institution	Status
BSc	Computer Science	University of Otago	Finished 2010
PGDip	Information Retrieval	University of Otago	Started 2018

### 1.7.1 Highlights

- Won the COSC343 robot competition
- Completed a GitHub search engine using GHTorrent and BigQuery.

### 1.7.2 Interest papers

- Health science 1st year
- Chemistry (200 level)
- Anatomy (200 level)
- Information Retrieval (400 level)
- Neural Networks (400 level)

### 1.7.3 Books read

Coherence in natural language. Data structures and applications.

## 1.8 Volunteer work

### 1.8.1 School of Computer Science

Ongoing. Tutoring junior school and high school students.

**started** 2018

**ended** Dec 2019

#### 1. proud moments

- (a) portfolio gallery (circa. 2018) Guided 2 high school students in building an interactive portfolio gallery for the Otago Settler's Museum.
  - Taught CSS, javascript, php.
  - Used Google Cloud NLP for transcribing spoken queries
- (b) built a bot that can play the board game codenames (circa. 2018)
  - Taught the concept of 'word vectors'.

### 1.8.2 General knowledge / skills (context)

Area	Context
Creating IDEs	LSP (Language server protocol)
Diagrams	Graphviz, Mermaid
Automating terminals	Automating and integrating virutally anything text
POSIX shell	Creating portable shell scripts
Language agnostic	Configuration files, code-gen
Linux	Containerisation, packaging, networking
Search infrastructure	Preprocessing, indexing, aggregation, presentatinon.
CLI interfaces	openautocomplete, TUI, emacs
CLI automation	tcl/expect, terminfo
CLI pipelines	jq, tcl/expect, python
CI/CD	GitLab
Lisp	Metaprogramming, Racket, elisp
GoLang	
Microservices	docker, k8s, GCP, AWS
Cloud Native	Serverless, CNCF
Preprocessing	rosie-lang, pcre, sed, awk, spacy
Documentation	report/blog writing, latex, org-mode
NLP	Word embeddings
Functional programming	racket, haskell
PPLs	Problog
emacs	Advanced usage (creating modes)
Research / learning	Search aggregation, presentation, blogging

### 1.8.3 General knowledge / skills (evidence)

Area	Evidence from my blog
Creating LSP client plugins	Creating an LSP mode for racket // Bodacious Blog
Automating terminal applications	Automating rat, a powerful productivity tool // Bodacious Blog
Build tool automation	Automating build systems for many languages
Polyglot programming	Languages supported by my development environment
Scripting / pipelines / automation	Reading YouTube rather than watching it
Building terminal user interfaces	Complex Dwarf Fortress macros with tcl/expect, emacs and tmux
Building debugging tools	tooling TensorFlow Debugger (tfdbg) and emacs DAP mode for emacs
Metaprogramming	Practical macros in Racket C++ template metaprogramming with Racket
Preprocessing	Filtering text streams
Algorithms	The Illustrated Transformer <a href="https://mullikine.github.io/glossary.html">https://mullikine.github.io/glossary.html</a>
Information retrieval	Tremendous Task: Searching for code on GitHub with BigQuery and GHTorrent
Documentation	Graphviz and Hugo Entropy, Cross-Entropy and KL-Divergence
Web development	The Semantic Web and Ontology
Deep learning	The Illustrated Transformer
Continuous Integration	<a href="http://codingingo.io">http://codingingo.io</a> Overview of modern Continuous Integration tools
Natural language processing	Named Entity Recognition
Functional programming	GHCi and Haskell code intermixed in babel
Telco / Microservices / Kubernetes	telco github GCP
Bayes	(WIP) Probabilistic programming with problog
Building editing environment	Browsing sqlite3 databases with edbi for emacs
Research / learning	Review of 'Language Engineering; Harnessing the Power of Language (2004)'
Code refactoring and linting	CodeQL by GitHub and Semmler CodeLingo vs Linters
I am always learning:	
<a href="https://mullikine.github.io/glossary.html">https://mullikine.github.io/glossary.html</a>	

#### 1.8.4 Tools

tool / skill

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emacs

vim

Deep TabNine

GPT-2

ctags

Google search automation

Code generation

Code snippet search

#### 1.8.5 Programming languages

I support many languages in my environment.

<https://mullikine.github.io/posts/emacs-languages-supported/>

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##### Language strengths

Table 1: legend

key

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OOP    object-oriented

FP     functional programming

Exp.    experienced

Language	Strong	Exp.	Advanced skills
Python	yes	yes	code-gen, reflection, own library, OOP, FP
bash / zsh	yes	yes	code-gen, own library, FP
c	yes	yes	code-gen
c++ (98)		yes	code-gen
c++ (13)		yes	code-gen
SQL	yes	yes	code-gen
Go	yes	yes	own library
CSS	yes	yes	code-gen
Haskell		yes	reflection, own library, FP
common lisp	yes		code-gen, FP
tcl/expect	yes	yes	code-gen, own library
emacs lisp	yes	yes	code-gen, own library, metaprogramming
scheme / racket	yes	yes	code-gen, own library, metaprogramming
problog		yes	code-gen
perl	yes	yes	
sed, PCRE	yes	yes	code-gen
awk	yes	yes	code-gen, own library
clojure			
javascript		yes	
java		yes	
jq	yes	yes	code-gen
graphviz	yes	yes	code-gen
latex	yes	yes	code-gen
vimscript	yes	yes	code-gen, own library
rosie			
CodeLingo Query Language	yes	yes	code-gen, own library, metaprogramming
CodeQL (GitHub / Lgtm)			
prolog			code-gen
rust			
typescript			
scala			
smalltalk			
R			

## 1.9 Citizenship

- Australia  
Eligible for an E-3 visa in the USA.
- New Zealand

## 1.10 References

### 1.10.1 Dr Zhiyi Huang

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### 1.10.2 Jesse Meek

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## **1.11 Contact details**

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### **1.11.1 LinkedIn**

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## **1.12 Colophon**

If there are missing pages or the formatting is off, you can find an original here:

**Online version:** <https://mullikine.github.io/cv/>

**PDF version:** <https://mullikine.github.io/ox-hugo/cv-newest.pdf>

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