

Matthew Barber

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PROFILE

I'm a BSc Computer Science graduate experienced in archive compression and signal processing. I am particularly proficient in Python, and am comfortable using many other languages including C++. I can engineer my own applications to accomplish bespoke tasks, from simple scripts to fully-fledged CLIs, and I'm capable of identify bottlenecks to optimise performance. I work efficiently alone, being a disciplined and resourceful individual always eager to improve my craft. I enjoy working with and learning from my peers, able to communicate my own ideas succinctly.

PROJECTS

coinflip

Python library for assuring cryptographic randomness in binary sequences. The randomness tests include techniques used in signal processing like DFT for Fourier transforms, GF(2)-optimised ranking for matrices, and Berlekamp-Massey for finding linear-feedback shift registers. All analysis and manipulation of sequences is achieved with pandas. A testing suite featuring pytest and Hypothesis ensures reliable results.

Recursive GZIP Bomb Tutorial

Comprehensive primer on the file format and compression algorithm theory involved in creating compressed file quines (i.e. extracts to an exact copy of itself, ad infinitum). Self-referential checksum was brute-forced by a multiprocessing Python script. The resulting file is used to smoke test Apache's Tika project and has exposed a macOS bug.

Linear B-cell Epitope Classification

Essay on exploring, preprocessing and modelling for a dirty proteins dataset. Subtle duplication patterns were identified, resolved via a bespoke Python script. Weka was used to create kNN, decision trees, Bayesian and logistic regression classifiers to find an appropriate model for both equal and uneven cost scenarios.

Statistical Test Suite for Python

C extension module that binds the randomness testing software to a Python library. Involved reworking the original state-based CLI program into a functional interface. coinflip is tested against this module to explore inconsistencies and expose bugs.

EXPERIENCE

Ferndale Homeless Shelter Volunteer

Nov. 2015–April 2019

Starbucks Barista

Sep. 2018–Feb. 2019

OTS Homeless Shelter Volunteer

Sep. 2018–Feb. 2019

Adventure Island Theme Park Host

July 2017–Sep. 2018






EDUCATION

Aston University

Sep. 2016–July 2020

1st (Honours) BSc Computer Science

FIND ME ONLINE

 github.com/Honno
 pypi.org/user/Honno
 kaggle.com/justhonno
 matthewbarber.io
 blog.matthewbarber.io

LANGUAGES

Python
C
C++
Lisp
SQL
JavaScript
Bash
Java

TOOLS

Git
Jupyter
Docker
pre-commit
GitHub Actions
TravisCI
AppVeyor

PYTHON PACKAGES

CFFI
pandas
NumPy
SciPy
scikit-learn
Matplotlib
Altair
pytest
tox
Hypothesis
PySpark
Redis
Jinja
Click
Flask
pewee
PyMongo
requests
Beautiful Soup
pywb