Aidan Lawford-Wickham

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Experience

Google Summer of Code

github repo

MetaBrainz Foundation Inc. `May 2019 ⇒ Aug 2019`

⇒ Designed and delivered a **scalable engine for similarity indexing** between ~14m audio recordings

⇒ Included Python, PostgreSQL, JavaScript, Docker

⇒ Exposed similarity indexing via RESTful API endpoints and continuous static data dumps

⇒ Developed a user-facing evaluation platform in React with AJAX to gauge performance of similarity engine

⇒ Implemented rigorous unit tests across all functionality and clearly documented the codebase

AcousticBrainz.org

github repo

Developer/Contributor `Feb 2019 ⇒ Present`

⇒ Frequent contributor to an **open-source/open-data** web application centered around audio data analysis

⇒ Reduced server CPU usage by **~50%** after improving database schema and optimizing PostgreSQL queries

⇒ Constantly refactoring Python codebase, improving unit tests and documentation of features

⇒ Interactively visualized genre classification of high dimensional data with t-SNE and PCA algorithms

⇒ Collaborated with ListenBrainz.org developers to build a shortest-path **playlist recommendation system**

U of T Data Science Team

github repo

Energy Forecast Team `Oct 2018 ⇒ Apr 2019`

⇒ Predicted peak energy demand days across Ontario using historical demand and weather patterns

⇒ Created and tested variety of models including recurrent and convolutional neural networks

⇒ Built a data scraper with Python to collect StatCan weather data and IESO energy data

Education

University of Toronto

`Grad: 04/2022`

BASc in Engineering Science, Dean's List, *CGPA: 3.28*
Coursework: Algorithms and DS, Programming, Digital Systems and Comp. Organization, Linear Algebra

Massachusetts Institute of Technology

`2017`

iD Tech Coding & Engineering Academy Certificate
Java Android development & object-oriented design

Skills

Programming Languages

Python | C/C++ | JavaScript | Java | MATLAB | Bash

Libraries, Frameworks, and Tools

Flask | SQLAlchemy | SQL | Docker | Linux | React | Django | Node | Git | TensorFlow | NumPy | CAD

Projects

"Galaxu" Android Game

github repo

⇒ Created an action-survival game with unique touchscreen joystick control and increasing difficulty

⇒ Implemented object-oriented design using Java with multithreading, canvas graphics, state management, and XML

C++ Graphics/Rendering

github repo

⇒ A growing collection of graphics tools written in efficient C++ with object oriented design principles

⇒ Implemented the raytracing algorithm to render 3D graphics complete with diffuse lighting, reflections, refractions, and gradient noise

F1 Racing Optimization

github repo

⇒ Given racetrack details, the program optimizes car configurations and favourable accelerations at each point on the track using reinforcement learning

⇒ Implemented with a custom-built OpenAI Gym to train a Q-learning model

⇒ Included use of Python, NumPy, and pandas

Terminal Chess AI

github repo

⇒ Developed a chess AI using a binary search tree and the minimax algorithm in Python

⇒ Increased AI efficiency using Alpha-Beta Pruning

⇒ Created a text-based UI to play within the terminal

Involvement/Activities

⇒ Google Code-In Mentor 2019
⇒ MetaBrainz Summit 2019 Attendee/Presenter
⇒ Phantom SUMO Robot Design Team Member 2019
⇒ Canadian Sailing Team Athlete 2018
⇒ 2-Time DECA Provincial Champion 2016, 2017