VINUSH VIGNESWARAN

Research Software Engineer

@ vinush10@hotmail.co.uk   in vinush-vigneswaran   ○ vinush-vigneswaran   ⌗ https://vinush-vigneswaran.github.io/

EXPERIENCE

Research Software Engineer in Computational Cardiology

The University of Edinburgh
Nov 2023 - Present

`Electrophysiology Simulations` `Qt` `Parallel Computing` `HPC`

- Developed an "analysis" feature for OpenEP library and EPWorkbench desktop application to estimate and visualise conduction velocity and divergence from electroanatomical data.
- Improved atrial fibrillation simulation runtime by $\sim$90% via code refactoring and vectorisation of mathematical operations.
- Implementing a data-to-simulation pipeline to analyse imaging and 3D data using High Performance Computers (HPCs).

QA Automation Engineer

V-Nova Ltd
Jan 2023 - Nov 2023

`Python` `Flask` `FFmpeg` `GitLab` `MongoDB` `Appium`

- Engineered and implemented a Flask-based backend for a web tool, utilising MySQL and Appium, to efficiently test video codec configurations on multiple mobile devices.
- Developed a fast batch video encoding and decoding testing framework using Python and behaviour driven testing methodologies.
- Reduced the testing process of $\sim$400 tests from 22+ hours to under 2 hours using parallelisation, and caching techniques.
- Implemented CI/CD pipelines with Jenkins, and employed dockerisation, enabling quick and consistent deployment across various machines and environments.
- Collaborated closely with stakeholders to identify and address crucial requirements for video analysis, including the validation of video frame drops, pixel mismatch, and bitrate control.

Graduate Automation Test Engineer

Qualitest (The Software Institute)
Nov 2021 - Jan 2023

`C#` `SpecFlow` `Selenium`

- Developed a BDD testing framework and conducted regression tests on the NHS Covid Pass web-app using C#, .NET5, SpecFlow and Selenium.
- Closely worked with NHS and Qualitest clients to create user stories and implement test scenarios.
- Improved Azure DevOps CI/CD pipeline and increased test efficiency by 40% through code optimisation and introducing parallel cloud testing.
- Utilised Jira and Confluence to track project progress and organise documentations.

ABOUT ME

I am a focused and driven engineer with over three years of experience in programming and machine learning. I currently research and develop algorithms and software for computational electrophysiology (EP). I have industry experience in software testing, designing, and conducting complex test cases and scenarios for projects such as the NHS Covid Pass and video codec enhancements. My passion lies in building robust software for automation and understanding the underlying architecture of cutting-edge technologies. I am excited to develop my current skill set and actively contribute to new and challenging projects.

SKILLS

Programming Languages:

`Python` `C#` `Java` `MATLAB`
`Beckhoff TwinCAT 3 (LL & ST)`

Technologies:

`Qt` `Git` `Jenkins` `MySQL`
`ReactJS` `AWS` `Django` `FFmpeg`

Machine Learning Libraries:

`Cohere` `PyTorch` `TensorFlow`
`Keras` `NLTK` `Scikit-learn`

Testing Tools & Management:

`Behave` `Allure Reporting` `SpecFlow`
`Selenium` `Cucumber`

Languages:

`English (native)` `French (advanced)`

CERTIFICATIONS

ISTQB Certified Tester | 2021
Foundation level qualification for software testing fundamentals.

EDUCATION

MSc in Artificial Intelligence (Distinction)
The University of Edinburgh
Sept 2020 – Sept 2021
- Applied Machine Learning, Deep Learning, Reinforcement Learning, Algorithmic Game Theory, Natural Language Understanding, Generation, and Machine Translation.

BEng in Mechanical Engineering (First Class Honours)
University of Birmingham
Oct 2016 – Aug 2020
- Computing for Engineers (Python & C), Engineering Mathematics (MATLAB), Electronics, Mechatronics & Control Engineering.

PROJECTS

Full-Stack Web App: The Ad-hoc Chef
Web Dev Project
Nov 2021 - Dec 2021

`Java` `React` `MySQL` `AWS`

- Developed a full-stack scalable Cocktail Recipe website from back-end (Java, REST API, SQL, AWS Services) to front-end (React, JavaScript).
- Automated Unit and BDD testing process using Jenkins, to trigger JUnit, Cucumber and Selenium tests.

Machine Learning for Visual Storytelling
MSc Dissertation at University of Edinburgh
Jan 2021 - Apr 2021

`Python` `PyTorch` `NLTK` `Facebook Detectron`

- Integrated state-of-the art deep learning techniques such as object detection (Faster-RCNN), and transformers for the Visual Question Answering (VQA) segment of the system.
- Developed a sentence embedding model, and utilised the embeddings to extract relevant portions of stories.
- Evaluated the complete pipeline via user studies and proposed automated metrics to evaluate the lexical diversity, coherence and fluency of this open-ended text generation task.

Intelligent Energy Management Control for Plug-in Hybrid Electric Vehicle
BEng Final Year Project at University of Birmingham
Sept 2019 - May 2020

`MATLAB` `Simulink`

- Built an intelligent energy management method for plug-in hybrid electric vehicle (PHEV) based on Fuzzy Logic and Particle Swarm Optimisation (PSO), to increase fuel economy.
- Simulated and analysed drive cycle performance, compared with different FLC optimisation techniques, such as Genetic Algorithm and Simulated Annealing.

ACTIVITIES

Abstract Acceptance | 2024
My abstracts on EP Workbench, a computational platform for identifying fibrotic regions in the atria, was accepted by four conferences: British Heart Rhythm Society, European Heart Rhythm Association, eCSE ARCHER2 Celebration for Science and the Edinburgh CVS Symposium.

2nd Prize Winner of Hackathon, Cohere | 2022
An AI-system capable of debating complex topics using advanced NLP models.

Sustainability Challenge, BCG | 2022
A recommender system that will optimise your AWS cloud resources strategy.

Head of Vehicle Dynamics, UBeRacing | 2020
Developed a formula-style electric vehicle for the Formula Student EV competition representing University of Birmingham.

AI Virtual Summer Program, R42 Group | 2020
Devised a project outline for a stock market predictor using Reinforcement Learning.

2nd Prize Winner Speak out for Engineers Challenge, IMechE | 2019
Presentation titled "From the Brain in the Machine to the Machine in the Brain" exploring AI in brain-computer interface for prosthetic limb control.

Volunteering in Ghana Africa, VSO | 2017
Worked with Volunteer Services Overseas (VSO) for a community development program in rural Ghana.

HOBBIES

`Hiking & Trekking` `Reading non-fiction` `Travelling` `Podcasts` `Swimming` `Electronics & Automation Projects` `Chess`