Francis Yates

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Education

University of York
First Class Master of Engineering in Computer Science with Artificial Intelligence *September. 2018 – July 2022*

Cockermouth school
A levels in: Maths - B, Physics - A, Computer Science - A *Sept. 2016 – July 2018*

Experience

Computer Science Buddy Scheme September 2021 – April 2022
University of York

- Provided support and advice to 3 first year Computer Science students about the challenges they faced starting university
- Held regular meetings to stay up to keep track of how each student was settling in and to address any developing issues

Computer Science Department Ambassador January 2019 – January 2020
University of York

- Represented the department at university open days giving tours and presenting live demonstrations in front of large groups
- Interacted with prospective students and their parents answering questions and encouraging them to study computer science at York

Projects

Chess Engine | *C#, WPF, xUnit* June 2022 – Present

- Developed a chess engine capable of following all rules of chess and finding a strong move in any board position
- Developed user interface to allow a user to play a full game of chess against the created chess engine
- Implemented various algorithms and heuristics to improve the speed and playing strength of the engine, such as alpha-beta pruning and futility pruning
- Created unit tests using xUnit in order to ensure correctness of code and evaluate performance

Drone Swarm for Offshore Wind Farm Maintenance | *Python, PyTorch* January 2022 – May 2022

- Worked as part of a group to fulfill a clients requirements designing and developing a prototype for an autonomous drone swarm assisting offshore wind turbine maintenance
- Communicated with stakeholders continuously to illicit and refine requirements
- Presented our ideas to a large group of peers, staff and external customers

CGAN Face Generator | *Python, NumPy, PyTorch, MatPlotLib, Pillow* May 2022 – May 2022

- Created a Condition Generative Adversarial Network capable of generating unique human faces lit by a point light from any direction
- Used NumPy for data handling and pre-processing before input to the CGAN in order to improve the quality of generated faces
- Augmented existing image data in order to expand the training dataset using Pillow in order to improve the quality of generated faces

Yee Grid Maxwell Equation Solver | *C, CUDA, OpenMP, OpenMPI* March 2022 – April 2022

- Modified a single threaded C implementation of a Yee Grid Maxwell Equation Solver in order to make a multi-process implementation using different methods
- Used CUDA to parallelise simulation and run on GPU resulting in a 34x speed up on the tested hardware
- Created a multi-threaded implementation using OpenMP in order to speed up program on multi-core CPU resulting in a 2.1x-11x speed up depending on the number of threads
- Created a multiprocessor implementation using OpenMPI in order speed up program on a multi CPU compute cluster resulting in a 2.1x-14x speed up depending on the number of CPUs

Evolutionary Snake | *Python, DEAP* February 2022 – March 2022

- Create a genetic algorithm allowing the evolution of a viable snake playing agent using DEAP toolkit
- Implemented mutation and crossover between successive generations using DEAP toolkit
- Tested snakes evolved performance given different hyper-parameters in order to select the best environment for snake training

Mixed Priority, AIM Simulation | *Java, Swing* March 2021 – May 2021

- Modified an existing simulation tool to allow an investigation into using a novel mixed priority intersection management protocol for use with autonomous vehicles at an uncontrolled intersection
- Gained familiarity with a large preexisting code base in order to successfully modify the functionality of the program
- Used statistical techniques to verify significance of results in order to report on the effectiveness of the new management protocol
- Received departmental award for best 3rd year project

Technical Skills

Languages: C#, Python, Visual Basic .NET, Java, C, mySQL
Frameworks: Epsilon Modelling Framework, WPF, xUnit, JUnit, Swing
Developer Tools: Visual Studio, Git, VS Code, PyCharm, IntelliJ, Eclipse
Libraries: NumPy, PyTorch, Matplotlib, ScikitLearn

Hobbies

Climbing: University of York Climbing Team 2021-2022
Cycling
Outdoors: Wild camping, Hiking, Open water swimming