Ethan Ray

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EDUCATION

University of Exeter **Exeter, Devon**
MSci Computer Science and Mathematics *September 2021- Expected June 2025*

- Expected Distinction Grade (1st Class Equivalent)
- Modules Include: Object Oriented Programming, Data Structures, Computers and the Internet, Mathematical Structures, Mathematical Methods, Software Development, Database Theory and Design, Artificial Intelligence and Applications, Mobile and Ubiquitous Computing, Vector Calculus and Applications, Differentials Equations, Fluid Dynamics.
- Relevant Coursework(s): Covid Live Data Tracker, Java Tour de France Portal, Django BeReal Social Media Clone.

WORK EXPERIENCE

Neural Connections **Exeter, Devon**
Software Developer *July 2023 – Present*

- Developed an app to interface with a piece of hardware worn by rugby players to monitor and detect concussions.
- Worked with low level Bluetooth code and device firmware to complete communication between devices.
- Created automatic calibration code for the devices' gyroscope and accelerometer streamlining the devices' setup procedure.

Hatless Studios **Exeter, Devon**
Software Developer + Product Owner (July onwards) *May 2023 – June 2024*

- Full-Stack Mobile App Development in Flutter & Python
- Lead a team of developers and UI/UX designers on two projects.
- Managing budgets of £50k+ for these projects, for which I assign hours, create burndown graphs to track progress versus expenditure.
- Host weekly standups and client meetings, going through Jira(s) and Kanban boards to increase productivity.
- Hatless Studios, acquires contracts with other companies which we fulfill such as:
  - University of Exeter developing a new mobile app for the students, which authenticates using AWS Cognito fetching users' timetable and information.
  - PostTag a navigation app aimed at delivery drivers, optimizes the route via Google Cloud API's.
  - MyPrompt a work in progress ADHD productivity app, utilizing android services for notifications and a in house python backend interfacing with an SQL database.

Academic Achievements

UKSCC – IndySCC 24 **USA, Atlanta**
Sysadmin – Representing the UK *Competing in November 2024*

- Selected as one of 6 out of 500+ applicants across the UK to represent the country in Atlanta, for the IndySCC, thanks to our sponsors at EPCC & EPSRC.
- Due to my strengths in Linux and C++, I have been tasked to manage the sysadmin of our cluster in preparation for the upcoming competition.
- The goal of the competition is to optimize both our cluster and the applications run on the cluster to achieve top performance, we will compete against other countries such as the USA and China.

Image Geolocation Classification AI **Exeter, Devon**
Undergraduate Dissertation – 78% *Completed May 2024*

- My Dissertation in which I achieved a high first class (78%), where the goal was to locate where images were taken.
- Used multiple machine learning techniques to geolocate images or a set of images, the aim being to reduce power and memory size required to run such models compared to existing methods.
- Successfully created a model which could run on a consumer grade card (RTX 3070) by optimizing Cuda libraries and batch loading of training data.
- My final project was able to beat some currently available models whilst making this computational sacrifice.

HackSouthWest – Hackathon **Exeter, Devon**
Achieved 3rd place *February 2024*

- Lead a team of 5, to compete in the HackSouthWest Hackathon with the theme of "finance", which had universities across the UK compete.
- We created a parody stock trading game, using real world trading data from multiple companies to use as substitute stock for our users
- Within 24 hours we managed to create a fully functional application hosted on a server where users were pitted against each other to earn as much money as they could before the timer ran out and featured a leader board that updated in real time.

PROJECTS

Steam Arbitrage Bot

Developed a Python bot to compare two markets, the Steam Marketplace and BitSkins. Due to these markets being different on trading platforms the same item can fetch different prices. Depending on which market we are selling on different fees are applied, this is factored into our pricing algorithm when calculating which items to buy from each respective market. Thus, by using both API's my program would find suitable items to purchase on each platform and sell them on opposing platforms respectively.

Uk100 Trading AI

One of my third year course works, which tasked us with finding/creating data and then applying a machine learning technique to it. I choose to analyse the UK100 index along with gold prices on a time series, calculating various indicators such as RSI, MACD and Standard Deviation at different intervals and putting them into a pandas data frame. After using a neural network along with a trading strategy, we performed back trading on unseen data to evaluate performance.

Pi Live Fourier Transform Lighting System

Here I developed a lighting system for an aspiring DJ, who wanted lights to react based on the music he was playing live. By computing a Fast Fourier Transform of the sound and breaking them down into their fundamental frequencies, we could colour a led strip in real time using optimizations like multi threading.

Monte Carlo Simulations

These simulations learnt how to play complex games with no evaluation function. By simulating thousands of games per second, it would find semi-optimal plays by pruning low probability outcomes and prioritizing high probability outcomes much like the famous AI AlphaGo. This idea could be extended into any other hard to evaluate system, like the stock market.

ADDITIONAL INFORMATION

- Proficient in Linux, Python, Java, C++, Flutter (Dart Lang), HTML, CSS, Lua, JavaScript and SQL.
- Used frameworks such as Flask, Django, React, TensorFlow also used tools such as GIT, Postman, Slack.
- Have interests in Snowsports, Poker, Drone Racing & Building and Chess.
- Most of these projects can be found on my website in extra details: https://www.ethan-ray.com