Anya Sims

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Education

***Jesus College, University of Cambridge* - Computer and Information Engineering MEng** **2018 – 2022**

Fourth year: *Modules* this year *cover areas including machine learning, deep learning with structured data, optimization, statistical signal processing, advanced probability theory, linear algebra, advanced information theory and coding, algorithms and data structures, software engineering, and more.*

Third year: First class with distinction; in 1st percentile (ranked 5th in exams). Awarded 3 university awards (for final project, and overall and information modules exam performance) and 2 college scholarships.

Second year: Received the college Engineering Prize (grades not awarded due to COVID).

First year: First class, awarded the college Engineering Prize and placed in the top 7% of the cohort.

Magdalen College School, Oxford **Sept. 2016 – Jul. 2018**
A level Mathematics (A*), Further Mathematics (A*), Physics (A*), Chemistry (A*), Biology (A*)

Headington School, Oxford **Sept. 2011 – Jul. 2016**
10 GCSEs (all grade A*)

Experience

Master's Project (ongoing):

End-to-end Automatic Speech Recognition using RNN-Transducers

- Working on End-to-End ASR using the RNN-Transducer model.
- First investigating the roles that that encoder and prediction networks are actually performing (eg. language model).
- Will then look at adapting popular lattice-based techniques, such as lattice rescoring, for application to models (such as the RNN-T) which have auto-regressive decoders.
- I am supervised by Prof. Phil Woodland, Head of the Machine Intelligence group at Cambridge.

Summer of 2021:

Applied AI internship with Graphcore

- Worked as part of the AI Applications team to implement an extensive and clear codebase demonstrating training Resnet architectures using Graphcore's IPU using TensorFlow2.
- This involved using pipelining for scheduling to coordinate intelligent loading of different stages of the model onto different IPU processing cores to maximise the efficiency of both training and inference.
- Received and wrote code reviews, and participated in daily stand-ups as well as wider team meetings.
- I learnt a huge amount about organisation and best practices that I am excited to be applying to my master's project.

3rd year Audio Modem project (Top ranked project report by Engineering Dept.)

- Worked as part of a small team to implement (in Python) a transmission system capable of transmitting and receiving data (text, images etc.) via sound waves.
- Involved detailed technical understanding of Fourier transforms and the effects of variable time delays etc.

Summer of 2020:

Machine learning project with Featurespace mentorship

- In depth technical exploration of widely used ML algorithms (using Scikit-learn), with invaluable insight from mentors.

Project on deep neural networks with VectorAI

- Implemented Neural Style Transfer - an exciting application of transfer learning – after reading several papers on the subject. It was fascinating and broadened my understanding of representation in deep CNNs.

Kaggle project on Abstraction and Reasoning Challenge

- Experimented with using CNNs with specially tailored architectures and kernel shapes to solve a series of abstract reasoning tasks (using Tensorflow and Keras). I experimented with writing my own cost functions and regularizers, and also investigated the possibility of using 2D LSTM sequence models.
- My main approach was to develop a complete reformulation of the challenge in which each new reformulated task had hundreds of training examples, rather than the handful from the original task.
- I found this challenge so exciting that I kept finding new inspiration and going back to try out new ideas.

Coursera courses: ***Deep Learning Specialization (deeplearning.AI, 17 weeks, TensorFlow and Keras)***
Natural Language Processing Specialization (deeplearning.AI, 16 weeks, TensorFlow and Keras)
Data Structures and Algorithms (UC San Diego, Python, currently completing)

Previous experience:

***WiTT Software Programme at Jane Street, London,* Aug. 2019**

- Built a model (in OCaml), implementing complex strategies to trade bonds and stocks with a virtual stock exchange.

***Data Analytics Internship at Infosys,* Jul. 2019 – Aug. 2019**

- Worked as part of the Data Analytics Research Department on Aspect-Based Sentiment Analysis (ABSA).
- I started by writing from scratch my own implementation for generating word embeddings.
- Reproduced results from a research paper, making use of Word2Vec embeddings (using TensorFlow and Keras).
- Also implemented an almost unsupervised, language-unspecific approach, which relied on several statistical machine learning techniques, including Brown Clustering and Latent Dirichlet Allocation (LDA).
- I learnt a lot about selecting and reading papers, and also about working with and learning from a team.

***Software development Internship at Softwire,* Dec. 2019**

- Used Javascript and React to build a robust website which makes use of asynchronistic API calls.

Hackathons

- I have participated in multiple Hackathons, including Cambridge Hack, and built valuable experience of project management, working with new people, working to an extremely tight deadline, and learning to use new tools quickly.
- Most notably I worked with a team to create a computer vision system to automatically collate and send data from physical dials and readings. Our team won the hackathon, and our solution went on to become the basis of a PhD project and is being implemented in a manufacturing company.

Mentoring and volunteering

- During Sixth form I took on the role of mentoring a young boy with autism, using games to discuss important aspects of school life. I found seeing the progress he made hugely rewarding, and it taught me about communication skills and coming up with creative ways to communicate complex issues.
- During university I have volunteered as part of the STIMULUS program, helping A-Level students with Maths. This was a great experience and also required similar skills of finding alternative ways to explain concepts.

Extracurricular

I am an active member of the University Cycling club and Jesus College Squash, and am Secretary for the University Windsurfing Club and an active member of the Sailing Club committee. I rowed competitively at school, often training 6 days per week. This taught me huge amounts about time management and self-discipline. I also love challenges and have done Gold and Silver Duke of Edinburgh and in 2019 I challenged myself to cycle 750km to Germany in six days.

Academic Awards

2013 – 2018 - Top overall in year group in school academic exams Headington and Magdalen College Schools

Headington school

GCSE years scholarship (2014), Anne Slater Promise in Science Prize (2014), Gold in Intermediate Maths Challenge and top in school. As a result, was invited to participate in the Hamilton Olympiad and following these results, was invited to and attended, the UKMT National Mathematics Summer School (2015), Distinction in the Mathematical Olympiad for Girls (2015), Distinction in the Mathematical Olympiad for Girls (2015, 2016), Elias Modern Languages prize – German (2015), Student Robotics Competition (school team achieved first place in league matches) (2015), 6th form Academic scholarship offer (2016).

Magdalen College School

6th form Academic scholarship (2016), Gold in Senior Maths Challenge (2017, 2018), President's Prize for Waynflete project on antibiotic developments (2017), Leavers' Physics Prize (2018), Ogle Newcombe Prize for Exceptional Promise (2018).

Jesus College, Cambridge

The Evans Prize and elected to the Exhibition of the College for achieving a First and placing in the first decile in Cambridge engineering (2019), Jesus College Prize for Part IB Engineering for performance in Tripos exams (2020), Derek Taunt Prize for Engineering (2021), Jesus College Scholarship for Tripos results (2021).

Engineering Dept., Cambridge

Distinction for ranking in top one percentile of year group (2021), prize for top ranking in Information Engineering Instrumentation and Control Area (2021), Top ranked project and 3rd year project prize for my Audio Modem project (2021).

Coding Skills

- Proficient with Python and confident with use of Git and Github.
- Used Linux extensively on several internships and for my master's project.
- Experienced with ML and deep learning libraries and frameworks, including TensorFlow, Keras, PyTorch, Scikit-learn, OpenCV and Pandas, Scipy, Numpy etc.
- Have also used MATLAB and C++, and have basic knowledge of Java, OCaml and R.