

NICHOLAS SALE

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New College, Holywell Street, Oxford OX1 3BN

EDUCATION

University of Oxford

October 2015 - Present

MMathCompSci Mathematics and Computer Science

Relevant Courses Taken

Topology
Topology & Groups
Rings & Modules
Machine Learning
Introduction to Representation Theory
Knowledge Representation & Reasoning

Being Taken This Year

Algebraic Topology
Computational Algebraic Topology
Homological Algebra
Categories, Proofs and Processes
Computational Learning Theory
Mathematics and Data Science for Development

RESEARCH EXPERIENCE

Applied Research Summer Placement

July 2018 - September 2018

UK Civil Service

Civil service references available on request

- 11-week placement within a small team working on statistical analyses of the impact of certain government cyber-security projects, where I was tasked with the open-ended goal of researching how machine learning and other data science techniques could be applied to aid the team with data annotation.
- Performed and wrote up experiments to support judgements on the efficacy and utility of different methods for automating this task, applying techniques from natural language processing, statistical learning, and topological data analysis.
- Presented my work and an introduction to topological data analysis in a seminar for the data science community within the government department.
- Also participated in the initial literature review for a new project on embedding internet-scale network graphs, in collaboration with the Alan Turing Institute.

Applied Research Summer Placement

July 2017 - September 2017

UK Civil Service

- 11-week placement within a government applied research department working on developing internet-related capability, where I was tasked with determining the feasibility of using data science techniques to identify certain types of network devices based on limited information about their traffic.
- Evaluated different models for network devices and produced visualisations to aid feature engineering, before experimenting with different statistical learning techniques for the classification.
- Presented my work at the kick-off meeting for a workshop on analysing network traffic.

Summer School Individual Research Project

July 2016 - September 2016

UK Civil Service

- Undertook a short project investigating the use of sheaves and sheaf cohomology in data science, following Michael Robinson's 'Tutorial on Sheaves in Data Analytics', and writing a short Haskell script to perform calculations.
- See <https://github.com/NickSale> for code.

Work Experience

BAE Systems, Great Baddow

July 2013

Microsoft Research, Cambridge

February 2014

- Spent two weeks at BAE Systems and a week at Microsoft Research learning about industrial research.

TECHNICAL SKILLS

Programming Languages Software & Tools

Experienced: Python, Java, C# Familiar: C++, Scala, PHP, Haskell
L^AT_EX, scikit-learn, pandas, Spark (parallel cluster computing)

Developed my technical skills and knowledge during an intensive 10-week summer school in 2016 which covered advanced topics in computer security, including some relevant applications of data science.

Worked on a 6-month engineering project as part of a team for the *Engineering Education Scheme* in 2014, working with Selex ES to design and build an autonomous vehicle. I took lead on researching, designing, and implementing the sensing, geometry representation and path-planning aspects of the project.

ACADEMIC ACHIEVEMENTS

New College Undergraduate Scholarship

October 2016 - Present

- Awarded for examination performance.

CyberFirst Bursary Scheme

October 2015 - Present

- A government and industry-backed initiative aiming to improve the UK's cybersecurity capability by supporting selected undergraduate students.

GResearch Computer Science Project Prize

2017

- Awarded for innovation in producing an automatic music composition program for a group project.

Arkwright Scholarship

September 2013 - September 2015

- A prestigious engineering scholarship awarded after examination and interview.

POSITIONS OF RESPONSIBILITY

New College Boat Club Committee

New College, Oxford

President 2018/19, Secretary 2017/18, Lower Boats Captain 2016/17, W3 Coach 2018

Bar Sports Captaincies

New College, Oxford

Darts Captain 2017/18, Pool Captain 2016/17

Oxford University Roleplaying Society Committee

October 2016 - October 2018

Netrep (IT Secretary)

EXTRA-CURRICULAR

I row, play bass guitar, and recently completed my Duke of Edinburgh Gold award.