Oliver Daisey

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EDUCATION

Durham University — **Durham, UK**
Ph.D. Mathematics — *October 2021 - Present (Expected Finish Spring 2025)*

University of Birmingham — **Birmingham, UK**
MSc Cybersecurity, high distinction — *September 2021 - September 2022*

University of Nottingham — **Nottingham, UK**
MMath Mathematics, high 1st class honours — *September 2018 - July 2021*

RELEVANT EXPERIENCE

Durham University — **Durham, UK**
Ph.D. Student — *October 2021 - Present*

- Research student in mathematics, working on polyhedral and computational geometry.
- Selected projects include implementing machine-learning preprocessing algorithms for scientific consulting firm OSC, and analysing stochastic models of inflation for pensions firm Hymans Robertson.
- Develop and maintain a collection of software packages for performing high-speed computations in Julia. Contributor to multiple open-source software projects including SageMath and OSCAR.
- Presented my published research at multiple international conferences.

Coltraco Ultrasonics — **Durham, UK**
Software Engineer — *April 2023 - Present*

- Engaged in a part-time role at an established ultrasonic technology firm, assuming a leadership position within its software division.
- Responsibilities include native Android development with Kotlin and Jetpack Compose, back-end development with Firebase, designing RESTful APIs, implementing security protocols, mentoring other developers and interns on good programming practice, and designing software architecture.

Smart Manufacturing Technology — **Nottingham, UK**
Research Contractor — *April 2022 - March 2023*

- Part-time position at a global engineering consultancy based in Nottingham.
- Position involves detailed analysis of mechanical designs, software development, automating workflows for the company, and contributing to the company's research and development.
- Modelled standard and novel parts in SOLIDWORKS CAD software and interacted with patent attorneys.

University of Nottingham — **Nottingham, UK**
Research Intern — *June 2020 - September 2020*

- School funded summer research internship under the supervision of Dr. Federico Municchi in computational fluid dynamics.
- Involved contributions to the open source CFD software OpenFOAM in C++. Set up and simulated test cases for Federico's filtered two-fluid model library. Improved documentation.
- Gave a presentation about work done at the APS DFD on November 23rd, 2020 (online).

University of Nottingham — **Nottingham, UK**
Research Intern — *June 2019 - September 2019*

- EPSRC funded summer research internship under the supervision of Dr. Alexander Kasprzyk in the university, studying cluster algebras & quiver mutation.
- Developed and reworked a collection of methods in Python for the SageMath Cluster Algebras package.
- Delivered a two-part talk on the 13th and 20th of November on my research to my university's weekly geometry seminars.

ADDITIONAL EXPERIENCE

Mathematics Teaching *October 2021 - Present*

- I perform both marking of undergraduate academic work, teaching classes, and administrative work at Durham.
- Involves teamwork with other markers, conformity to tight time constraints and organisational commitments preparing material for each class.

Internship Supervisions *Summer 2024 - Present*

- I supervised two internship projects both at Durham University and at Coltraco Ultrasonics, one of which led to a publication.
- Involved strong leadership skills, in depth technical knowledge, and an empathetic attitude.

Mathematics Tutoring *June 2018 - Present*

- I teach mathematics to A Level and GCSE students to prepare them for A Levels and the STEP examinations.

PASS Leader *September 2019 - June 2020*

- Organised and lead small group sessions for first year mathematics students. Taught students basic undergraduate mathematics and mentored them on academic life in general.

SELECTED PUBLICATIONS

- O. Daisey & Y. Ren. *A Generalized Framework for Tropical Homotopy Continuation.* Published in *Lecture Notes in Computer Science, Springer,* 2024.
- O. Daisey & T. Ducat. *A Laurent phenomenon for the Cayley plane.* Published in *SIGMA 20 (2024)*, 2024.
- O. Daisey, F. Municchi & J. Cloete. *An opensource tool for filtered two-fluid simulations of fluidized gas-particle flows.* Published in *APS-DFD 2020, Chicago*, 2020.

ACHIEVEMENTS & HONOURS

- Achieved 'Martin Pluck G103' prize for having the highest average marks of any graduating student on my masters course.
- Achieved 'IMA Prize', a complementary membership to the Institute for Mathematics and its Applications, for very high performance in my masters course.
- Achieved 'Mathematics Prize' for highest average mark in the third year of my degree.
- Achieved 'School Prize' for high performance in the second year of my degree.
- Received offers for funded PhD places at Durham University, Lancaster University, and The University of Nottingham. I was cited as the best applicant in years at Lancaster.

SKILLS

- Deep mathematical and technological knowledge, especially in mathematical modeling, machine learning, analysis and development of algorithms, cryptography, and implementation of computer security protocols.
- Programming Languages: Python, Julia, C, C++, C#, Java, Kotlin, JavaScript. Experience with deep learning frameworks, .NET framework, version control systems, web technology stacks, and native Android app development. Very capable of upskilling within tight time constraints.
- Software: Office suite, IDA Pro, Ghidra, Wireshark, SOLIDWORKS, MATLAB, OpenFOAM, Mathematica, Maple, SageMath, OSCAR, various IDEs.
- High levels of competence in self-teaching, general high-level research skills (both academic and industrial), adopting new technologies, and interpersonal skills. Strong general scientific understanding.

REFERENCES

References are available upon request. My **website** provides more details about my academic work.