# **Oliver Daisey**

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**O** oliverdaisey

October 2021 - Present (Expected Finish April 2025)

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### **EDUCATION**

**Durham University** Ph.D. Mathematics

University of Birmingham MSc Cybersecurity, high distinction

University of Nottingham MMath Mathematics, high 1st class honours

## **RELEVANT EXPERIENCE**

### **Durham University**

Ph.D. Student

- Research student in mathematics, working on polyhedral and computational geometry.
- Selected industry projects include implementing machine-learning preprocessing algorithms for scientific consulting firm OSC, and analysing stochastic models of inflation for pensions firm Hymans Robertson.
- o 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**

Software Engineer

- 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, Java, and Jetpack Compose, backend development with Typescript and Python via Firebase, designing RESTful APIs, implementing security protocols, mentoring other developers and interns on good programming practice, and designing software architecture appropriate for medium-sized Android apps.

### Smart Manufacturing Technology

Research Contractor

- Part-time position working with a global engineering consultancy based in Nottingham.
- Contributed C# modules to implement mathematical models of geartrain dynamics. Modelled standard and novel parts in SOLIDWORKS CAD software. Interacted with patent attorneys.

### University of Nottingham

Research Intern

- 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

Research Intern

- 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.

# October 2021 - Present

Durham, UK

Durham, UK

Birmingham, UK

Nottingham, UK

September 2021 - September 2022

September 2018 - July 2021

#### Durham, UK

April 2023 - Present

Nottingham, UK

Nottingham, UK

April 2022 - March 2023

June 2020 - September 2020

Nottingham, UK June 2019 - September 2019

# **ADDITIONAL EXPERIENCE**

### **Mathematics Teaching**

- 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

- 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

• 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 gasparticle 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, (Type)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.

October 2021 - Present

Summer 2024 - Present

June 2018 - Present