Oisín Davey

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Education

University of Cambridge | Cambridge, United Kingdom | October 2025 - Present.
- M.A.St. of Mathematics in Theoretical Physics, member of Wolfson College.
- Studying general relativity, quantum field theory, statistical field theory, differential geometry, and symmetries in Part III of the Mathematical tripos, widely considered to be the world's most intensive mathematics degree.

Maynooth University | Kildare, Ireland | September 2021 – June 2025
- BSc in Theoretical Physics & Pure Mathematics.
- Awarded 1.1/First Class Honours. Awarded the Hamilton Prize for the top 9 undergraduate students of mathematics in Ireland along with all 7 other prizes available in my course of study. Ranked 1st amongst all science students. Founded Physics & Chemistry Society.
- Studied Besicovitch sets, fractal geometry, functional analysis and measure theory as part of a mathematics summer internship (June 2025 – August 2025).

Skills

Programming language acquisition: Comfortable and practiced adapting to languages to suit the needs of a project; having incorporated C++ & Python in major projects. Well versed with Git from various projects.
Tutoring: Annually contracted by University College Cork training our international Programming Olympiad team; academic tutor for 1st science at Maynooth University; volunteer training the national Mathematics Olympiad class. My work in education resulted in my membership within the Irish Mathematical Trust.
Data structures & Algorithms: Represented Team Ireland for three consecutive years in the International Programming Olympiad (IOI), winning a bronze medal in Singapore 2021. Placed 1st in the All-Ireland Collegiate Programming contest in 2023. Represented Maynooth University at UKIEPC (Edinburgh University) and NWERC (TU Delft) in ICPC regionals.

Experience

Software Development Internship | CERN - Geneva | June 2024 – September 2024
- Developed the proprietary graphical tool "Vis-à-Gis" using the geodesy api PyQGIS and Qt to aid the beam surveyors in analysing the results of "Logiciel Général de Compensation", detailing the measurement network precision data from surveys of the Large Hadron Collider.
- Created, for Vis-à-Gis, a novel computational method for displaying projections of confidence ellipsoids using spectral approaches.
- Honed my French, the operative language of the section for internal documentation.

Photonics Research Fellowship | Tyndall - Cork | June 2023 – September 2023
- Produced original C++/Python model of the spectra of quantum-confined stark effect based electro-absorption modulators, based on Elliott theory.
- Using time complexity analysis, I optimised the efficiency (from cubic to log-linear) of the old model by using the iterated Arnoldi method, and by realising an expression of the model as a discrete convolution thence computable with fast-fourier transforms. This resulted in computing 4.8 wavefunctions per second on a lattice with 100,001 points.

Research & Development Internship | SENUS - Athlone | June 2022 – August 2022
- Agri-tech startup, worked in soil science and meteorological data science.
- Using QGIS, created personalized data reports/visualisations for farming clients, detailing correlations of rainfall, crop hue (obtained via satellite imagery API), cloud cover, temperature, etc. Statistical correlations were computed with C++.
- Developed proprietary digital soil penetrometer prototype to assess soil bulk density in the field. The device sent stress/strain and real-time kinematics data for a standard soil probe via radio to a GNSS base station. GNSS computations were computed using RTKLib, embedded systems programming, and Python.