Daniel James Mills

About:

I am a 2nd year PhD student researching quantum computation. With extensive experience in mathematics, physics and computer science, I am eager to conduct research leading to the widespread utilisation, expanded applicability, and heightened understanding of quantum computation.

Highlights:

- Master of science by research (Distinction)
  - Quantum computing focus
  - Top of class
- Master of mathematics (1st class)
  - Covered mathematics, physics, computing
- Extensive research engagement prior to PhD
- Practical experience in technology industry
- Skilled programmer and writer
- Well practiced science communicator, presenter and radio show host

Education:

University of Edinburgh CDT in pervasive parallelism **Doctorate** **2016-present**

- Supervised by Professor Elham Kashefi and focusing on the verification of early stage quantum computers by observing limited architecture, experimental noise, etc.
- Other research areas: machine learning using quantum computing, classical simulation of quantum computations, superiority of quantum over classical computing, quantum computing software.

University of Edinburgh **MSc (by research) : Distinction (top of class)** **2015-2016**

- Received grade of 90% for dissertation titled 'Information Theoretically Secure Hypothesis Test for Temporally Unstructured Quantum Computing' which was supervised by Professor Elham Kashefi.
- Courses on machine learning, categorical quantum computing and complexity theory.
- Included several courses on conducting effective research which improved my time management and academic writing as well as presentation, planning and reflection skills.

University of Warwick **MMath : 1st (Hons)** **2011-2015**

- Broad studies with a focus on Analysis; particularly information theory and dynamical systems.
- Extensive coverage of algebra, number theory, probability theory, geometry, fluid dynamics, computational mathematics, numerical analysis and scientific programming.
- Fourth year project, 'Communication Over Binary Symmetric Channel With Random Failure Rate', supervised by Professor Oleg Zaboronski.
- Studied many modules from physics including those on quantum mechanics and cosmology.

Work Experience:

Title: Makerspace Assistant Technician PhD Intern
Employer: The University of Edinburgh **Dates: 05/2018 - present**

- Maintained, utilised, and taught the use of digital manufacturing technologies and related software, including: 3D printing, scanning and design; CNC milling and cutting; virtual and augmented reality; Raspberry Pis and electronics.

- Managed and developed marketing material, including social media profiles and instructional videos.

Title: Research and Development Intern
Employer: Atos / Bull SAS **Dates: 09/2017 - 02/2018 (6 months)**

- Implementing a classical simulator of my own developed my understanding of: programming languages C, C++, python and openMP; software development tools Git, Jenkins and Callgrind; and how to integrate my work into a large team project.
- Utilised classical simulation and HPC as a tool to provide new insights into quantum computing and, in particular, into the impact of physically motivated noise.
- Extensively researched methods for classical simulation of quantum computation and communicated these complex ideas to the rest of the team through code annotation and presentations.

Title: Research Engineer Placement Student
Employer: Siglead Europe **Dates: Summer 2014 (2 months)**

- Designed, understood and modelled error correction codes used in solid state memory.
- Tested my model by investigating, numerically (using C and MATLAB) and experimentally, the behaviour of individual cells within memory.
- Conducting research within a geographically distributed start-up (UK and Japan) taught me the tools used in research, running a business and communicating with distant collaborators.

Title: Undergraduate Research Support Scheme intern
Employer: The University of Warwick **Dates: Summer 2013 (2 months)**

- Project, 'The Evolution of Eigenvalues in Random Matrices', supervised by Dr Roger Tribe.
- Developed MATLAB code to simulate random matrices and attended courses improving research, writing, presentation, quick thinking and teamwork skills.

Title: Mathematics and Physics Mentor
Employer: Saffron Walden County High School **Dates: 2009-2011**

- Explaining topics related to mathematics and physics to year 11 students improved my ability to communicate new ideas and adapt explanations quickly to fit the audience.

Other Skills:

- Trained in: programming languages Java, MATLAB, Python, C++ and C; quantum computation programming tools such as pyQuil; Linux and Windows operation systems; Microsoft Office and LaTex.
- Skilled writer and speaker due to several conference presentations and posters (at, for example, QPL and TQC respectively, with details at my website, linked below), and experience as a radio presenter.

Other interests and achievements:

Obtaining the gold Duke of Edinburgh award made me accustomed to being relied on and relying on others.

I hosted my own science news show on the Edinburgh student radio station and was elected as head of the news team, with responsibilities such as organising the script and team for the weekly show and coordinating the student union election debates. I was also part of the team producing the Edinburgh informatics pod-cast.

For the tenpin bowling club at the University of Warwick, I managed an internal league and I was also treasurer for the postgraduate society at the University of Edinburgh.

Personal Information and Contact Details:

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