Daniel James Mills

About:

I am a 3rd year PhD student researching quantum computation. With extensive experience in mathematics, physics and computer science, I am eager to participate in research and development 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. Several courses on conducting effective research, improving my time management, 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. Fourth year project, 'Communication Over Binary Symmetric Channel With Random Failure Rate', supervised by Professor Oleg Zaboronski.
- Extensive coverage of algebra, number theory, probability theory, geometry, fluid dynamics, computational mathematics, numerical analysis and scientific programming; as well as many modules from physics including those on quantum mechanics and cosmology.

Work Experience:

Title: Tutor for Introduction to Quantum Computing (Masters level course)
Employer: The University of Edinburgh **Dates: 09/2019 - 11/2019 (3 months)**

- Presenting and preparing tutorials for this first course in quantum computation taught me to articulate complex ideas at appropriate levels, while also allowing me to clarify my own ideas of the field.

Title: Research Intern
Employer: Cambridge Quantum Computing **Dates: 07/2019 - 09/2019 (3 months)**

- Developing benchmarking procedures for quantum technology, at all layers of the technology stack, taught me about results in quantum complexity, the intricacies of quantum computing architectures, and a variety of applications of quantum computers.
- Implementing these benchmarks familiarised me with interfaces for quantum devices such as Rigetti's Forest SDK and cloud service, and the IBMQ experience.

Title: Makerspace Assistant Technician PhD Intern
Employer: The University of Edinburgh **Dates: 05/2018 - 06/2019 (13 months)**

- 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 through code annotation and presentations.
- 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.

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.

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.

Other Skills and Achievements:

- Trained in: programming languages Java, MATLAB, Python, C++ and C; quantum computation programming tools such as pyQuil and qiskit; Linux and Windows; Microsoft Office and LaTex.
- Skilled writer and speaker due to several conference presentations and posters (at, for example, QPL and TQC, with full details at my website, linked below), and participation in 3MT competition.
- I hosted my own science news show on the Edinburgh student radio station and was elected as head of the news team. There I organised the script and team for the weekly show and coordinated the student union election debates. I was also part of the team producing the Edinburgh informatics pod-cast.
- I co-organised QuHackEd, Scotland's first quantum computing themed hackathon. This four day event, consisting of talks and a competition, taught me to manage and mediate between suppliers, communicate with speakers and motivate attendees, and acquire sponsorship totalling £15000.

Personal Information and Contact Details:

LinkedIn: `www.linkedin.com/in/dan-mills/`, Website: `https://danmills0.github.io/`, Email: daniel.mills@ed.ac.uk, Mobile: (+44) 07443497392, DoB: 28/03/1993.