Henry Cox

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About me

I am excited about the future and I want to use my knowledge and skills to help improve peoples lives. I relish a challenge and enjoy working outside of my comfort-zone and learning new skills, which I have done in the workplace and at university. I like to meet new people and maintain good rapport and relationships with my colleagues, as I believe that the best work cannot only be achieved by individuals. I am looking for a challenging technical role with room for growth, where I can implement my problem solving and analytical skills in state-of-the-art technology applications.

Experience

PhD Student – Biological Physics

The University of Manchester – Sept 2015 to present

Since starting my PhD I have worked with a synthetic peptide (I_3K) which forms long fibrils and networks. My work has focused on recording and analyzing microscopy images of fibrils – which I had no prior experience of before starting. I also begun with no programming experience and have since written hundreds of scripts to perform analysis of my data.

The first major piece of work I completed used a super resolution microscopy technique called STORM to image the structure of networks formed by I_3K fibrils. This is a reconstruction technique that uses 30,000 raw images to improve the final image resolution by ten times. I developed sample preparation techniques specifically for the experiment, recorded millions of images and processed them to form the final data set. Next, I wrote data analysis scripts necessary to make sense of the millions of data points I had recorded. The culmination of this work was my first publication as first author which featured on the front cover of the peer-reviewed journal *Biomacromolecules*, see my publications for more details.

Since then I have focused on the dynamic motion of these filaments in their networks by recording and analysing videos of filaments in the network. Throughout this work I have learnt image processing and filtering techniques and developed scripts to perform Fourier decomposition, nonlinear curve fitting and basic outlier analysis – which I used to show that the filaments in the network are under stress.

I also frequently collaborate with people inside and outside the university, which typically involves me adapting my sample or using my experience with a technique to help solve a common problem – I have imaged my sample on graphene oxide coated glass, imaged graphene using STORM and helped a group from Warwick University to image synthetic polymers using STORM.

Undergraduate laboratory demonstrator

The University of Manchester – Sept 2015 to present

Alongside my PhD I have also held a teaching role in the 2nd year undergraduate teaching labs. I am responsible for up to 9 pairs of students simultaneously, spread over 4 different physics experiments. As well as teaching the students I also have to assess students through an interview.

This is a role I have really enjoyed as I like getting to know new people and building rapport with the students. Also, it has been a good opportunity for me to begin developing my experience as a leader. Over the 3 years I have become much better at guiding students towards solutions and dealing with any problems they have with their work or with the marks they have received. I have also begun to write demonstrator guides for the experiments I run so that new demonstrators can easily started.

Team work

A PhD can be an individual piece of work, however I enjoy working in a team and have experience working with a wide range of people.

Throughout my time at BP I worked in a team with engineers spanning many disciplines. In particular, I worked with technicians and oil rig managers offshore as well as onshore planners and specialist contractors to ensure the safe installation of new equipment offshore.

At Bath RUH, I worked with other support officers as we helped and taught all levels of hospital staff on the new IT system.

Development

I enjoy learning and love the feeling of making progress and bettering myself, through structured learning and personal projects.

I actively seek out opportunities to learn and have organized an external industrial mentor in order to help me develop and learn.

Throughout my PhD I have met my supervisor weekly, where I am happy to receive constructive criticism in order to further my work.

I also enjoy pushing myself physically as well as mentally and last year I completed my first sprint triathlon in Salford Quays.

Operations Critical Telecoms Engineer

BP North Sea – Sept 2014 to Sept 2015

I worked for a year in Aberdeen supporting the operations critical and safety critical telecommunications equipment installed on BP North Sea assets. This was a new role in the business and so I spent the first few months meeting with the control engineers and technicians who managed the equipment at their specific assets and learning about the equipment installed and the relevant standards.

I managed, planned and oversaw the installation of safety critical telecoms equipment offshore. Which included, arranging contractors, aligned documentation to ensure 'gate-criteria' were met and the job was delivered on time. Discussed with the installation managers to ensure problems did not compromise safety offshore.

I developed and created an equipment dashboard which was used by telecoms engineers to ensure the safety critical maintenance procedures were being completed in compliance with BP, national and international standards.

Operations Critical Telecoms Intern

BP Exploration – June 2013 to Sept 2013

As an intern at BP I completed a project assessing the use of collision avoidance radar onboard BP oil rigs across the world and compared this with the current state of radar technology. First, I read industry and BP standards, and discussed radar with my colleagues internally and specialist external radar vendors to help me develop a good understanding of a new commercial technology available. I attended the factory acceptance test for new radar and used my new knowledge to ensure the test was representative of real world use (height above sea level for a radar is critical to performance). I presented the results of my work to senior BP engineers in a global telecoms meeting and following my internship I was offered a permanent role as a graduate engineer to start the next year.

IT Support Officer

Bath RUH NHS Trust – June 2011 to Sept 2011

I worked in a major hospital in Bath and supported the IT department as a new patient and care management system was deployed across the hospital. First, I had to quickly become familiar with the system and learn how all the different types of used need to interact with the system (e.g. checking in patients, ordering prescriptions). I was then stationed in sections of the hospital where I worked 1-1 with all levels of staff there to ensure they did not come into problems when using the system. I learnt to manage my relationships with staff carefully as they were already in a very stressful environment and so changing the way they were doing the majority of their paperwork was not going to be easy for them. Overall, it was an amazing experience to see how these health professionals work and the system was deployed successfully.

Qualifications

Master of Physics – MPhys

The University of Manchester – Sept 2010 to Sept 2015

Obtained a first class degree with an average mark of 79%. Learned to formulate and solve complex technical problems by identifying the correct means to do so and making appropriate simplifications to obtain a solution. Learned and used mathematical methods to describe and model a wide range of physical problems. Gained experience in technical open-ended investigations and the critical analysis of the results, with particular focus on the significance of the results and how they compare with theoretical predictions.

Analysis

I have learnt and used many different analytical tools and methods such as:

- Linear regression
- Fourier analysis
- Correlation functions
- Monte Carlo simulations
- Non-linear modelling
- Logistic regression
- Support vector machines
- Neural networks
- Principle component analysis
- Anomaly detection
- Statistical inference
- Optimisation algorithms
- Advanced image analysis and object detection.

Publications

I have authored multiple peer-reviewed research papers since starting my PhD. Three are published (one as first author) and another three are submitted for publication (one as first author).

For full details please see henrycox.co.uk or contact me.

Programming

I begun my PhD with no programming experience, since then I have self-taught in MatLab and have produced hundreds of scripts featuring state-of-the-art analysis techniques.

I am familiar with git and have worked on personal projects and with my industrial mentor in python and ruby, which can be seen on my website.

Community

I have recently attended meetups with the Hadoop and Big Data group and the Python User group.

I also enjoy pushing myself physically as well as mentally and last year I completed my first sprint triathlon in Salford Quays as part of Manchester Triathlon Club.