

## 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. I like to meet new people and I endeavor to improve the work of myself and my colleagues, through good working relationships. 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. You can find out about me in more detail at my website: [henrycox.co.uk](http://henrycox.co.uk), or just give me a call/email.

## 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 images and videos of fibrils using state-of-the-art microscopy and data analysis techniques – which I had no prior experience of before starting.

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. I developed sample preparation techniques specifically for the experiment, recorded millions of images and processed them to identify information in the images. Next, I wrote data analysis scripts necessary to interpret the large data set. The culmination of this work was my first publication as first author which featured on the front cover of the peer-reviewed journal *Biomacromolecules*, (DOI: 10.1021/acs.biomac.7b00465).

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. This work is currently in submission to *Nature Communications*.

I also collaborate with other researchers by sharing my knowledge and expertise to help solve a common problem. This has resulted in two further published articles as co-author (DOI: 10.1021/acsami.6b04939 and DOI: 10.1021/acsami.6b03770), and two more which are currently in the peer-review submission process.

### Undergraduate laboratory demonstrator

*The University of Manchester – Sept 2015 to present*

Alongside my PhD I have also held a teaching role in the 2<sup>nd</sup> 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, which I conduct. After the interview, I give them constructive feedback and ensure I have answered any further questions they have about where they can improve.

This is a role I have really enjoyed as I like getting to know and building rapport with the students. Also, it has been a good opportunity for me to begin developing my experience as a leader. As I have gained experience as a demonstrator, 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 get 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.

At BP 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.

As a student, I was captain of the Water Polo 2<sup>nd</sup> Team for 2 yrs and organised team fixtures for 1 year.

## 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 which I meet fortnightly.

Throughout my PhD I have met my supervisor weekly, where I am happy to receive constructive criticism in order to further my work. I frequently attend research conferences and, among others, presented at the 2018 RSC Biomaterials Group meeting.

## Operations Critical Telecoms Engineer

*BP North Sea – Sept 2014 to Sept 2015*

I worked for a year in Aberdeen supporting the operations- and safety-critical telecommunications equipment installed on BP North Sea assets.

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

I developed and implemented 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.

I also organised a technical poster competition which featured over 100 entrants and 20 judges from within BP. At BP I attended training such as on continuous improvement practices as well as offshore safety training.

## 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. I learned industry and BP standards, and developed my understanding of the technology through discussion with my colleagues and specialist external vendors.

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 user interacted 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 learned 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.

### Machine Learning

*Stanford University – Sept 2017*

### A-Levels

*Frome Community College – Sept 2009 to Sept 2010*

Physics (A), Maths (A\*), Further Maths (B)

## Analysis

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

- Regression
- Fourier analysis
- Correlation functions
- Machine Learning
- Non-linear modelling
- PCA
- Anomaly detection
- Statistical inference
- Optimisation algorithms
- Advanced image analysis and object detection
- Monte Carlo simulations

## Programming

I began my PhD with no programming experience, since then I have self-taught in MatLab and 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 (see my website).

## Community

I attend the Data Science Institute seminars of the University of Manchester and meetups such as the Hadoop and Big Data, and Python User groups.

I also enjoy a physical challenge and completed my first sprint triathlon in 2017 with Manchester Triathlon Club.