Henry Cox

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About Me

I am driven, strive to do my best and enjoy tackling challenging technical problems. I consistently performed at the top of my class during university and I am comfortable handling complex mathematical problems. I have proven written and verbal communication skills and value productive relationships with my peers. These have been developed through a wide range of experiences working with many different people in different situations from hospitals and supermarkets to oil rigs and offices.

Key Achievements

- Learnt and applied advanced imaging/data analysis techniques to understand the physical properties of protein fibrils through microscopy. Presented my results in peer reviewed articles and in person at national and international conferences (1st prize at Manchester Biomaterials Workshop 2018).
- Designed and developed predictive models for electric car charging usage at Evergreen Smart Power.
- Managed and delivered safety critical equipment upgrades to telecommunications equipment on oil platforms in the North Sea whilst working as an engineer at BP.
- Mentored and coached my peers after being voted captain of the University of Manchester Water Polo Men's Second team for two years running.

Research

2015 - Present The University of Manchester – Biological Physics PhD

Awards: Best presentation – Manchester Biomaterials Characterisation Workshop 2018

My research has focussed on recording and analysing images and videos of synthetic peptide fibrils using state-of-the-art microscopy and data analysis techniques. I have become an expert in STORM super-resolution microscopy which I have used to image the self-assembled structures of peptides for my core PhD research but also in collaboration with Perrier group from Warwick and in support of a patent application within our group for a Graphene Oxide based project

1st author publications (2 published, 1 in preparation)

Developed techniques to image the 3D network of peptide fibrils in the bulk using STORM super-resolution microscopy, removing surface effects and allowing very high precision measurements of the underlying network structures and processes. This featured on the front cover of *Biomacromolecules* 2017, 18 (11), DOI: 10.1021/acs.biomac.7b00465

Videoed the thermal motion of fibrils in a peptide gel network and through analysis, I separated the intrinsic fibril persistence length from stresses imposed on the network. I then used methods from machine learning to identify the sub-population of stressed fibrils within the sample and quantified their physical properties. This work has been published in *Langmuir* (DOI: 10.1021/acs.langmuir.8b03334) and was presented at Manchester Biomaterials Characterisation Workshop 2018 where I won 1st prize.

I have recently developed this work to decorate the peptides with the thermo-responsive polymer pNIPAM which can modulate stress in the network and this work is currently being prepared for submission in a separate article.

Co-authored publications (3 published, 1 accepted, 1 submitted, 2 in preparation)

Characterisation of the peptide I_3K/pNIPAM system (in preparation).

STORM imaging/analysis and particle tracking size measurements of cyclical peptide aggregates in collaboration with Perrier group in Warwick (in preparation).

STORM imaging, resolution and contrast measurements of images of peptides with and without graphene oxide surface coatings, *Sci. Rep.* DOI:10.1038/s41598-018-35297-4, patent application approved.

STORM imaging of edge functionalized graphene, *Sci. Rep.* (submitted).

ACS Applied Materials and Interfaces, DOI: 10.1021/acsami.6b04939 and DOI: 10.1021/acsami.6b03770 and *Nature Comm.* (accepted) – advice on peptide science, article writing.

Qualifications

Sept 2017 **Stanford University (online) – Machine Learning**

2010 - 2014 **The University of Manchester – Master of Physics (Hons) - 1st Class (79%)**
Dissertation testing anti-gen/anti-body binding efficiency for novel immunoassays.

2006 - 2010 **Frome Community College**
A levels: A*, A, B; **AS levels:** B, C;
GCSEs: 3 A*, 6 A, 1 B.

Work Experience

Sept 2018 **Evergreen Smart Power – Junior Data Scientist**

Worked with a technical development team to develop Python code to model and predict domestic car charging behaviour.

Selected and applied the appropriate statistical tools and presented the main results to non-technical company directors through an interactive 1 hour live demo in Jupyter notebooks.

2015 - 2018 **The University of Manchester – Laboratory Demonstrator**

Responsible for up to 9 pairs of students simultaneously, spread over 4 different types of experiments.

Taught the students and conducted interview assessments, giving constructive feedback.

Developed my managerial skills; guiding students towards solutions and helping new demonstrators to find their feet.

2014 - 2015 **BP North Sea – Operations Critical Telecommunications Engineer**

Supported the operations and safety-critical telecommunications equipment installed on BP North Sea assets.

Developed and implemented an equipment dashboard to ensure that safety-critical maintenance procedures were being completed in compliance with BP, national and international standards.

Managed the installation of safety critical telecoms equipment offshore, which included arranging contractors and completing engineering documentation to ensure the job was delivered on time.

Organised a technical poster competition which featured over 100 entrants and 20 judges from within BP. Completed as part of my involvement with the BP Graduate scheme.

2013 **BP Exploration - Operations Critical Telecommunications Intern**

Assessed the use of collision avoidance radar onboard BP oil rigs across the world and compared it with the current state of modern radar technology, by learning about the new technology and applying industry and BP standards. Attended factory acceptance tests.

2011 **Bath Royal United Hospital - IT Support Officer**

Supported the delivery of a new patient and care management system at the Bath Royal United Hospital that was replacing paper based records.

Coached all levels of staff on a one-to-one basis to help them overcome any problems they had once the system went live.

2009 - 2010 **Drivetech Ltd. – Go-kart Instructor and Marshal**

2007 - 2009 **J. Sainsbury's - Customer Service Assistant**

Professional Development

Regularly attend the Data Science Institute seminars of the University of Manchester and meetups such as the Hadoop and Big Data, MancML, and Python user groups where I would like to participate more actively in future.

Actively seek out opportunities to learn and have organised an external industrial mentor which led to my role at Evergreen SmartPower.

Interests and Activities

Completed my first sprint triathlon in 2017 with Manchester Triathlon Club.

Completed the Manchester 10k for the last two years.

Enjoy playing 5-a-side football.

Follow the Premier League and keen Fantasy Football player.

Enjoy travel and recently went on a two week road trip around the south-west USA following a research conference I attended in Los Angeles.

Played Water Polo for four years during my Masters and was voted second team captain for two of those years.

Additional Skills

IT:
Microsoft Office, Graphic Design (Corel Draw), LaTex, Markdown, Dropbox, MacOS, Windows, Linux.

Programming:
Proficient: Python, MatLAB, Bash, Git/GitHub.

Familiar: Ruby, SQL, CSS, HTML.

Languages:
Native: English

Basic: German (AS level), Spanish and Mandarin (self-taught).

Full UK Driving License

References available upon request