Nathan Hughes

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Personal Statement

I am an extremely driven and motivated PhD student, in all things; I make it my goal everyday to improve upon the last. With a true thirst for knowledge and desire for understanding, it is my long-term goal to pursue a career in academia.

Employment History

Sept 2017 - Sept 2018	Doonan Lab - Bioinformatician In this role I analysed and prepared large data sets for publication. Typically working in crop traits and genetics. This involved a lot of collaboration and interaction with different research groups.
May 2016 - Aug 2017	National Plant Phenomics Centre - Systems Developer My role at the NPPC was extremely varied. I worked on building and designing a Gravimetrics system for plant phenotyping and data generation, writing image analysis software. A large part of my time was devoted to data analysis and statistical evaluation of data.
Sept 2015 - June 2018	Aberystwyth University - Demonstrator I was a mentor to first and second year students during their workshops. Specifically I helped to reinforce the knowledge students learn in their lectures.
May - Sept 2013	Belfast Metropolitan College - Systems Specialist I had been employed as an IS advisor/specialist by BMC to implement their multi-campus systems upgrade.
Feb 09 - March 2013	Salto National Gymnastics Centre - Gymnastics Coach Sports coach for national level athletes

Education

Current	**PhD**	Computation Biology	John Innes Centre	
June 2018	**BSc**	Computer Science	Aberystwyth University	**1:1**
May 2014	**Diploma**	Software Engineering	Belfast Metropolitan College	**Distinction**

Publications

1. Nathan Hughes, Karen Askew, Callum P. Scotson, Kevin Williams, Colin Sauze, Fiona Corke, John H. Doonan, and Candida Nibau. Non-Destructive, High-Content Analysis of Wheat Grain Traits Using X-Ray Micro Computed Tomography. *Plant Methods*, 13(1), 2017. 00004
2. Frederick Cook, Nathan Hughes, Candida Nibau, Beata Orman-Ligeza, Nicole Schatlowski, Cristobal Uauy, and Kay Trafford. Barley lys3 mutants are unique amongst shrunken-endosperm mutants in having abnormally large embryos. *Journal of Cereal Science*, 82:16–24, 2018
3. Nathan Hughes, Nick Fradgley, Hugo Oliveira, Fiona Corke, James Cockram, John H. Doonan, and Candida Nibau. Grain depth increases during early domestication in small grain cereals. *The Plant Journal*, 2019

Research Experience

My current project is focused on uncovering the mechanisms in which cell-to-cell communication operates, specifically in examining *plasmodesmata* and how molecules move from one cell to another.

Previously my work has been primarily focused on genomic and phenotypic research in crop science. Specifically computer vision analysis and QTL mapping of seed and grain traits. Additionally I have spent considerable time designing and building automated systems specifically for gathering and generating scientific data.

Skills

Research Skills:	Statistical Analysis, Research Methods, Image Analysis, Academic Writing
Experience:	Machine Learning, Artificial Intelligence, Data Modelling
Programming Languages:	C/C++, Python, R, Java, MATLAB, BASH, LaTeX, Haskell, Ruby, HTML, PHP, Perl

Awards

Genetics Society Research Grant 2017	**Recipient**
UK-RAS Field Robotics Contest 2016	**3rd place**
Aberystwyth Excellence Scholarship	**Recipient**

Talks

FOSDEM	**Lightning Talk** | https://fosdem.org/2017/schedule/
BCS	**Show and Tell** | http://midwales.bcs.org/show-and-tell-events/
Aberystwyth U	**Bioinformatics workshop** | www.users.aber.ac.uk/msn/abw/

Examples of work

Grain Analysis Software	To streamline a data analysis pipeline that I created, I developed a set of tools to allow for straight-forward analysis of 3D grain parameters. This software allows a user to run statistical analysis in a reproducible environment (https://github.com/SirSharpest/Grain_Analyser_GUI)
Biology of the cell course	Having fallen in love with biology whilst studying computer science at university, I have started a small project to make a openly available crash-course style of notes for anyone from a non-biology background. I contribute to it quite regularly and plan to complete full series of biology information (https://github.com/SirSharpest/Bio-Cramming)
Image analysis software	As a side project I have started building a Rubik's cube solver which uses OpenCV and AStar IDS to provide instructions for a user to complete a cube puzzle. This is in early stages but progress can be seen at my GitHub which is updated regularly (https://github.com/SirSharpest/Rubkis-Cube-Solver)

References

Prof M. Morris	**Plant Health Programme Leader, JIC** | Richard.Morris@jic.ac.uk
Prof J. Doonan	**Director, NPPC** | jhd2@aber.ac.uk
Dr H. Dee	**Senior Lecturer, Aberystwyth University** | hmd@aber.ac.uk
Dr C. Sauze	**Data Manager NPPC** | cos@aber.ac.uk
Mr P. Greenwood	**Project Manager, BMC** | PGreenwood@belfastmet.ac.uk