

Nathan Hughes

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PERSONAL STATEMENT

I am an extremely driven and motivated PhD student. With a true thirst for knowledge and desire for understanding, it is my long-term goal to pursue a career in academia.

EMPLOYMENT HISTORY

FEB 2019 - CURRENT	The Brilliant Club Charity- PhD Tutor During the school year I run and design tutorials for school-age students. This role works towards reducing higher-education inequality by providing lessons in state-schools with an under-representation at highly-selective universities.
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 undergraduate students during their workshops.
MAY - SEPT 2013	Belfast Metropolitan College - Systems Specialist I had been employed as an IS specialist by BMC to implement a 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

- N. Hughes, K. Askew, C. P. Scotson, K. Williams, C. Sauze, F. Corke, J. H. Doonan, and C. Nibau. Non-Destructive, High-Content Analysis of Wheat Grain Traits Using X-Ray Micro Computed Tomography. *Plant Methods*, 13(1), 2017
- N. Hughes. Open access data of wheat grain traits using X-ray micro computed tomography. *Aberystwyth University Data Store*, 2017
- F. Cook, N. Hughes, C. Nibau, B. Orman-Ligeza, N. Schatłowski, C. Uauy, and K. Trafford. Barley lys3 mutants are unique amongst shrunkendosperm mutants in having abnormally large embryos. *Journal of Cereal Science*, 82:16–24, 2018
- N. Hughes, N. Fradgley, H. Oliveira, F. Corke, J. Cockram, J. H. Doonan, and C. Nibau. Grain depth increases during early domestication in small grain cereals. *The Plant Journal*, 2019
- N. Hughes, R. J. Morris, and M. Tomkins. PyEscape: A narrow-escape problem simulation implementation. *Journal of Open Source Software*, Feb. 2020

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 for gathering and generating scientific data.

SKILLS AND KNOWLEDGE

Research skills:	Statistical analysis, Research methods, Image analysis, Academic writing
Practical skills:	Hardware design, Pneumatic construction, PCB design, Electrical engineering, Product invention
Experience:	Machine learning, Bayesian methods, Data mining, Artificial intelligence, Data modelling
Programming languages:	C/C++, Python, R, Java, MATLAB, BASH, \LaTeX , Haskell, Ruby, HTML, PHP, Perl, Lisp

AWARDS

UK OPEN SOURCE AWARDS - STUDENT CATEGORY 2019	1st place
GENETICS SOCIETY RESEARCH GRANT 2017	Recipient
UK-RAS FIELD ROBOTICS CONTEST 2016	3rd place
ABERYSTWYTH EXCELLENCE SCHOLARSHIP	Recipient

RESEARCH TALKS / LECTURES

GENETICS SOCIETY	Research presentation	http://www.genetics.org.uk/
FOSDEM	Lightning Talk	https://fosdem.org/2017/schedule/
BCS	Project update	http://midwales.bcs.org/show-and-tell-events/
ABERYSTWYTH UNIVERSITY	Bioinformatics Conference	http://www.users.aber.ac.uk/msn/abw/

OPEN SOURCE PROJECTS

Grain analysis software	To streamline a data analysis pipeline, I developed a set of tools to allow for straight-forward analysis of 3D grain parameters (https://github.com/SirSharpest/Grain_Analyser_GUI)
Learn X in Y - Tutorials	I have contributed to, and written the basis of a number of tutorials on the popular programming site "Learn X in Y" (https://github.com/adambard/learnxinyminutes-docs)
Wikipedia contributions	Science is most useful when it is accessible, in my spare time I contribute and write articles on Wikipedia.org
Biology of the cell course	I started a small project to make an openly available crash-course for anyone from a non-biology background. (https://github.com/SirSharpest/Bio-Cramming)
Image analysis software	For fun, I built a Rubik's cube solver which uses OpenCV (https://github.com/SirSharpest/Rubikis-Cube-Solver)

REFERENCES

PROF R. 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
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MR P. GREENWOOD	Project Manager, BMC	PGreenwood@belfastmet.ac.uk