

# Alan O'Callaghan

BIOINFORMATICS · SOFTWARE · DATA SCIENCE

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## Skills

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- Programming** R, C++, Ruby, Java, Python.  
**Statistics** Bayesian modelling, GLM, survival analysis, high dimensional statistics.  
**Computing** Linux/Unix,  $\text{\LaTeX}$ , git, make, unit testing, continuous integration, bash.  
**Web** HTML/CSS, JS, PHP, htmlwidgets (R).

## Education

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### Ph.D., Biomedical data science

*Edinburgh, Scotland*

MRC HUMAN GENETICS UNIT, UNIVERSITY OF EDINBURGH

2018 - 2021

- Statistical methods and applied statistical analysis for single cell RNAseq in multi-donor experimental designs
- Implementation of scalable Bayesian inference (adaptive Metropolis within Gibbs)
- Assisting supervision of other students and contributing to research and computing environment in the institution

### M.Sc., Bioinformatics and computational genomics (Distinction)

*Belfast, Northern Ireland*

QUEEN'S UNIVERSITY BELFAST

2014 - 2015

- Dissertation: Java-based eye-tracking and image analysis of histopathology whole slide images
- Lectures: programming, image analysis, statistical learning techniques
- Programming projects: Implementation of alignment, clustering, linear regression and cross-validation algorithms in R; cell detection, Ki67 quantification and image segmentation in Java

### B.Sc. (hons), Biopharmaceutical chemistry (2.1)

*Galway, Ireland*

NATIONAL UNIVERSITY OF IRELAND, GALWAY

2008 - 2013

- Research Project: Structure elucidation and SAR of bioactive marine compound
- Lectures: (bio)chemistry, toxicology, pharmacology, molecular modelling, drug discovery and design

## Experience

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### Bioinformatician

*Edinburgh, Scotland*

FIOS GENOMICS

October 2015 - August 2018

- Communicating regularly with clients to plan projects and explain results.
- Exploratory and statistical analysis for academics and commercial clients.
- Statistical analysis & visualisations for client publications & commercial research projects.
- Extensive software development.
- Author & maintainer of several proprietary R packages.
- System administration tasks (VMware, Ansible).

### IT Support

*Belfast, Northern Ireland*

QUEEN'S UNIVERSITY BELFAST

September 2014 - September 2015

- Technical support, maintenance, document recovery, device configuration.

### Kelly Services

*Galway, Ireland*

IT SUPPORT

April 2014 - September 2014

- Technical support for major online game: troubleshooting, management, configuration.
- Friendly, professional, clear, and informed communication at all times.

### Irish Marine Institute

*Galway, Ireland*

RESEARCH ASSISTANT

April 2011 - September 2011

- Extracting marine specimens, chromatography, bioassays, devising procedures & SOPs.
- Deep sea research cruise on Celtic Explorer (primary Irish research vessel), interdisciplinary team of 20. Sample classification and cataloguing, communication and co-ordination with other researchers.

## Writing

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### CO-AUTHORSHIPS

- *heatmaply: an R package for creating interactive cluster heatmaps for online publishing*  
**Bioinformatics**, 2017 (DOI)
- *Species-specific regulation of angiogenesis by glucocorticoids reveals contrasting effects on inflammatory and angiogenic pathways*  
**PLoS One**, 2018 (DOI)
- *Stress perception impacts on clinical signs of skin ageing and modifies the epigenome*  
**Journal of Investigative Dermatology**, 2016 (DOI)

## Presentations

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### IGMM statistical seminar series

Online

#### PRESENTER

Summer 2020

- Exploratory data analysis
- Experimental design, hypothesis testing, statistical power

### Applied statistical analysis workshop for single cell RNAseq

IGMM

#### PRESENTER

March 2020

- Exploratory analysis
- Normalisation
- Feature selection
- Differential expression analysis
- Clustering

## Conferences and meetings

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### IGMM internal meetings

Edinburgh

#### POSTER

2019-2020

- Scalable Bayesian analysis of single cell RNAseq
- Bayesian analysis of multi-donor scRNAseq data (2<sup>nd</sup> prize)

### Normjam: jamboree for normalisation methods in scRNAseq

New York Genome Center

#### ATTENDEE

November 2019

- Discussions on, and posterior predictive checks for, scRNAseq normalisation methods.

### UoE Centre for Statistics conference

Edinburgh

#### POSTER

June 2019

- Scalable Bayesian analysis of single cell RNAseq

### Quantitative Genomics

Francis Crick Institute

#### PRESENTER

June 2019

- Scalable Bayesian analysis of single cell RNAseq

### Genomic Medicine

Edinburgh

#### POSTER

May 2019

- Scalable Bayesian analysis of single cell RNAseq

### Edinbr (R user group)

Edinburgh

#### PRESENTER

March 2019

- Building interactive modules using htmlwidgets

- Interactive data visualisation using R and plotly.

## Extracurricular

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### Github/Bioconductor

#### CONTRIBUTOR

- Contributor:
  - heatmaply
  - BASiCS
- Maintainer:
  - contrast
  - scater
- Miscellaneous other contributions.

### Society committees

Edinburgh/Galway

#### MEMBERSHIP

2018 - 2021

- **IGMM Postgraduate Society:** Organising student events, advocating for improvements in student working conditions and well-being.
- **IGMM social committee:** Organising social events for students/postdocs/staff.
- **Lotus society:** Organising yoga classes and events for students/postdocs/staff.

## Honors & Awards

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- 2018 **Best savoury food (mattar paneer)**, IGMM Christmas Party
- 2011 **School of Chemistry Medal (Molecular Modelling and Drug Design)**, NUI Galway
- 2008 **Entrance Scholarship**, NUI Galway