Euan Thomas McGonigle

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Research Interests

My research interests primarily lie in nonstationary time series, change point detection and wavelet methods in statistics. My current research has a strong emphasis on the development of new statistical models and methodology for analysing time series that display time-varying statistical properties, with particular interest in applications to environmental science and finance.

Professional Experience

- **Research Associate**   Bristol, UK
  School of Mathematics, University of Bristol   *Aug. 2020 – present*
  Research areas: change point analysis, nonstationary time series

- **Research Intern**   Lancaster, UK
  STOR-i Centre for Doctoral Training, Lancaster University   *Jul. 2015 – Sep. 2015*
  Research topic: Used Bayesian change point analysis to model linguistic style of the author Fanny Burney.

Education

- **Lancaster University**   Lancaster, UK
  PhD in Statistics and Operational Research   *Oct. 2017 – Jul. 2020*
  Supervisors: Rebecca Killick and Matthew Nunes
  Thesis title: Wavelet Methods for Locally Stationary Time Series

- **Lancaster University**   Lancaster, UK
  MRes in Statistics and Operational Research; **Distinction**   *Oct. 2016 – Sep. 2017*
  Dissertation title: Novel Wavelet Models for Nonstationary Time Series

- **University of Glasgow**   Glasgow, UK
  Msci in Mathematics; **First class honours**   *Sep. 2011 – Jun. 2016*

Publications

- **Refereed Journal Articles**

  ○ McGonigle, E. T. and Cho, H. (2022+) Robust multiscale estimation of time-average variance for time series segmentation. *Computational Statistics and Data Analysis* (to appear). [Open Access link] [Link to code on Github].

  ○ McGonigle, E. T., Killick, R., and Nunes, M. A. (2022) Modelling time-varying first and second-order structure of time series via wavelets and differencing. *Electronic Journal of Statistics*, 16 (2):4398-4448. [Open Access link] [Link to code on Github].

  ○ McGonigle, E. T., Killick, R., and Nunes, M. A. (2022) Trend locally stationary wavelet processes. *Journal of Time Series Analysis*, 43(6):895-917. [Open Access link] [Link to code on Github].

  ○ McGonigle, E. T., Killick, R., and Nunes, M. A. (2021) Detecting change in mean in the presence of time-varying autocovariance. *Stat* 10 (1), e351. [Open Access link].

- **Preprints**

  ○ McGonigle, E. T. and Peng, H. (2021) Subspace Change-Point Detection via Low-Rank Matrix Factorisation. *ArXiv preprint arXiv:2110.04044.* [arXiv link].

Talks

- **Invited**

  - **Change point detection for complex time series data**
    EcoSta 2021 (virtual), HKUST, Hong Kong   *Jun. 2021*

  - **Modelling nonstationary time series with wavelets and differencing**
    University of Bristol Statistics Seminar, UK   *Nov. 2020*

  - **Modelling nonstationary time series with wavelets**
    Numerical Algorithms Group, Oxford, UK   *Oct. 2019*

  - **Detecting changes in mean in the presence of autocovariance**
    2019 Joint Statistical Meetings, Denver, Colorado, USA   *Jul. 2019*

- **Contributed**

  - **Nonparametric change point analysis of multivariate time series**
    Royal Statistical Society International Conference 2022, Aberdeen, UK   *September 2022*

  - **Modelling time-varying first and second-order structure of time series via wavelets and differencing**
    Lancaster University Workshop on Time Series and Spatial Statistics, UK   *May 2020*

  - **Detecting changes in mean in the presence of autocovariance**
    STOR-i PhD forum, Lancaster, UK   *May 2019*

  - **Locally stationary wavelet processes with trend**
    STOR-i PhD forum, Lancaster, UK   *Jun. 2018*

Teaching & Supervision

- **Teaching**

  - **Tutor**, University of Bristol, *Jan. 2021 – present*

    * Tutor for 1st year Probability
    * Ran online drop-in sessions for 3rd year Multivariate Analysis

  - **Lecturer**, Introduction to R Programming, Lancaster University, *Jul. 2018 – Jul. 2019*
    Prepared and delivered an R training course for the STOR-i research interns.

  - **Graduate Teaching Assistant**, Lancaster University, *2017 – 2020*
    Delivered workshops and tutorials in a range of modules:

    * MATH103 Probability I
    * MATH104 Statistics
    * MATH105 Linear Algebra I
    * MATH215 Complex Analysis
    * MATH225 Abstract Algebra
    * MATH230 Probability II
    * MATH235 Statistics II
    * MATH334 Time Series Analysis
    * STOR605 Inference and Modelling

  - **Undergraduate Teaching Assistant**, University of Glasgow, *Jan. – May 2016*
    Undergraduate teaching assistant for Mathematics 2D Topics in Linear Algebra and Calculus.

- **Supervision**

  - **STOR-i 2018 Summer Internship**, Supervisor, Lancaster University, *Jul. – Sep. 2018*
    My responsibility was to design a research project and supervise an undergraduate research intern.

Honours & Awards

- **Research Conference Travel Fund**, Lancaster University   *Feb. 2020*

- **Dougall Prize for Distinction in Honours Mathematics**, University of Glasgow   *Jun. 2016*

Other Professional Activities

- **Refereeing**: Journal of the American Statistical Association, Environmental and Ecological Statistics, Journal of the Korean Statistical Society, Journal of Multivariate Analysis, Journal of Statistical Software, Statistics and Computing.

- **Consultancy**: Have participated in the Statistics Clinic, a free statistical consulting service for researchers at University of Bristol since 2021.

- **Memberships:** Fellow of the Royal Statistical Society.

Service

- Student representative for Masters students, Lancaster University, 2016 – 2017.

- STOR-i Centre for Doctoral Training website organiser, 2017 – 2020.

Technical Skills

- **Programming Languages**: R (advanced), MATLAB (intermediate), C (intermediate).

- **Programming Skills**: R Package development, interfacing `R` with C.