THOMAS GRUNDY

EDUCATION

2021 | 2018 **PhD in Statistics (in collaboration with Royal Mail)**
STOR-i Centre for Doctoral Training — Lancaster University, UK
Thesis: On Aspects of Changepoint Analysis (Expected Completion: Aug 2021)

Research areas included: time series analysis, changepoint detection, forecasting, sequential monitoring of stochastic processes, high-dimensional statistics.

2018 | 2017 **MRes in Statistics and Operational Research (Distinction)**
STOR-i Centre for Doctoral Training — Lancaster University, UK
- President of University Equestrian Team

2017 | 2014 **BSc in Mathematics and Statistics (1st with Hons.)**
Project: Modelling Premier League Football — Lancaster University, UK
- Team Captain of University Equestrian Team & College Football Team

RESEARCH EXPERIENCE

Present | 2020 **Sequential Monitoring of Forecast Accuracy**
Aim: Detect inaccuracies in forecasts of the number of parcels being processed at Royal Mail delivery offices in an online fashion.
- Created statistical methodology to monitor & identify inaccuracies in forecasts
- Applied methodology to Royal Mail datasets
- Produced software in R to flag inaccurate forecasts in real-time

2021 | 2020 **Detecting Changes in Motion Capture Data**
Aim: Detect changes in human activities using motion capture data.
- Converted video file data to usable multivariate time series data
- Created statistical methodology to detect subspace changepoints
- Detected changes in human activity to within 1 second of true time of change
- Produced R package changepoint.cov to implement methodology

2019 **Research Sprint: Investigating Bentley Vehicle Faults**
Aim: Within a 1 day time frame, generate ideas and potential research directions for monitoring the occurrence of vehicle faults in Bentley's.
- As a team, we suggested Poisson-based models to forecast fault occurrences
- I deployed changepoint techniques to improve forecasting capabilities

2020 | 2019 **Identifying Break Points in S&P500 data**
Aim: Identify changes in daily closing stock prices for 447 companies from the S&P 500.
- Using novel methodology, I identified changes in closing stock prices that correspond to major events including Brexit.
- This could be used to improve stock market forecasts, allowing for a competitive edge in stock trading.

TEACHING EXPERIENCE

2021 | 2018 **Graduate Teaching Assistant**
Led workshops for a range of Maths modules — Lancaster University
- Created and led R course for first year undergraduates
- Modules include Time Series Analysis, Machine Learning & Medical Statistics

2019 **STOR-i Intern Supervisor**
Supervised intern studying changepoint analysis — Lancaster University

PUBLICATIONS

2020 **High-Dimensional Changepoint Analysis via a Geometrically Inspired Mapping**
Grundy T., Killick R., Mihaylov G.,
Stat Comput **30**, 1155–1166 (2020), 10.1007/s11222-020-09940-y

CONTACT INFO

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For more information, please contact me via email.

SKILLS

Experienced in creating, developing and implementing statistical methodology

Confident with machine learning models and data visualisation

Highly skilled in R, LaTeX, Git, Markdown, Shiny

Familiar with Python, SQL, C/C++, HTML, CSS, Bash, Microsoft Office

Produced multiple R packages including changepoint.geo, changepoint.cov and changepoint.forecast

Worked with Linux, Windows and MacOS

PERSONAL PROJECTS

Shiny application for detecting changepoints
grundy95.shinyapps.io/changepoint-shiny

Using machine learning to cluster Premier League and American Football sports teams
grundy95.rbind.io/post/nfl-prem-matchup