# **Michael Fop**

Contact details	Address:	School of Mathematics and Statistics University College Dublin Belfield, Dublin 4, Ireland		
	E-mail:	michael.fop@ucd.ie		
	Website:	https://michaelfop.github.io		
CURRENT ACADEMIC POSITIONS	Lecturer/Assistant Professor in Statistics2019 - PresentSchool of Mathematics and Statistics, University College Dublin			
	<b>Programme</b> School of M	2019 – Present		
PAST ACADEMIC POSITIONS	Lecturer/As School of M	ssistant Professor in Statistics (under the bar) athematics and Statistics, University College Dublin	2018 – 2019	
	Postdoctora Insight Cent	<b>al researcher in Statistics</b> re for Data Analytics, University College Dublin	2017 – 2018	
Education	<b>PhD in Stat</b> University C Supervisor:	<b>istics</b> ollege Dublin Prof. Thomas Brendan Murphy	2017	
	Master's Degree in Finance and Statistics2013with honors, University of Perugia			
	Bachelor's with honors	<b>Degree in Economics</b> , University of Perugia	2010	
	Published a	articles		
	<ol> <li>Gwee X. Y., Gormley I. C., Fop M. (2023). A latent shrinkage position model for binary and count network data. <i>Bayesian Analysis</i>, to appear.</li> </ol>			
	<ol> <li>Nagle M., Price S., Trotta A., Destrade M., Fop M., Ní Annaidh A. (2023). Analysis of in vivo skin anisotropy using elastic wave measurements and Bayesian modelling. <i>Annals of Biomedical</i> <i>Engineering</i>, 51:1781–1794.</li> </ol>			
	11. D'Angelo, S., Alfò, M., Fop, M. (2023). Model-based clustering for multidimensional social net- works. <i>Journal of the Royal Statistical Society Series A: Statistics in Society</i> , 186(3) 481–507.			
	<ol> <li>Casa A., Cappozzo A., Fop M. (2022). Group-wise shrinkage estimation in penalized model-based clustering. <i>Journal of Classification</i>, 39:648–674.</li> </ol>			

9. Fop M., Mattei P-A., Bouveyron C., Murphy T.B. (2022). Unobserved classes and extra variables in high-dimensional discriminant analysis. *Advances in Data Analysis and Classification*, 16, 55–92.

- 8. Casa, A., Fop, M., Murphy, T.B. (2021). Contributed discussion to *Centered partition processes: informative priors for clustering*, by Paganin, S., Herring, A.H., Olshan, A.F., Dunson, D.B. *Bayesian Analysis*, 16(1), 301-370.
- 7. Rastelli R., Fop M. (2020). A stochastic blockmodel for interaction lengths. *Advances in Data Analysis and Classification*, 14, 485-512.
- O'Connor S., McCaffrey N., Whyte E.F., Fop M., Murphy T.B., Moran K.A. (2020). Can the Y balance test identify those at risk of contact or non-contact lower extremity injury in adolescent and collegiate Gaelic games? *Journal of Science and Medicine in Sport*, 23(10) 943–948.
- 5. Fop M., Murphy T.B., Scrucca L. (2019). Model-based clustering with sparse covariance matrices. *Statistics and Computing*, 29(4), 791–819.
- O'Connor S., McCaffrey N., Whyte E.F., Fop M., Murphy T.B., Moran K.A. (2018). Is poor Hamstring flexibility a risk factor for hamstring injury in Gaelic games? *Journal of Sport Rehabilitation*, 28(7), 677-681.
- 3. Fop M., Murphy T.B. (2018). Variable selection methods for model-based clustering. *Statistics Surveys*,12, 18-65.
- 2. Fop M., Smart K., Murphy T.B. (2017). Variable selection for latent class analysis with application to low back pain diagnosis. *Annals of Applied Statistics*, 11(4), 2085–2115.
- Scrucca L., Fop M., Murphy T.B., Raftery A.E. (2016). mclust 5: Clustering, classification and density estimation using Gaussian finite mixture models. *The R Journal*, 8(1), 289-317. *"Highly Cited Paper" by Web of Science – Among the top 100 most cited papers of the last 10 years in the field of Mathematics.*

#### **Preprints and submitted papers**

- Gwee X. Y., Gormley I. C., Fop M. (2023). Model-based clustering for network data via a latent shrinkage position cluster model. *Under review*, arXiv:2310.03630.
- Cappozzo A., Casa A., Fop M. (2023). Sparse model-based clustering of three-way data via lassotype penalties. *Under review, arXiv:2307.10673*.

#### Conference proceedings and other publications (peer-reviewed)

- Promskaia I., O'Hagan A., Fop M. (2023). A compositional stochastic block model for the analysis of the Erasmus programme network. *CLADAG 2023 Book of Short Papers*, ISBN: 978-88-9193-563-2
- Casa A., T. B. Murphy, Fop M. (2023). Partial membership models for high-dimensional spectroscopy data. *CLADAG 2023 Book of Short Papers*, ISBN: 978-88-9193-563-2
- Casa A., Cappozzo A., Fop M. (2022). Penalized model-based clustering with group-dependent shrinkage estimation. International Conference on Soft Methods in Probability and Statistics, in Building Bridges between Soft and Statistical Methodologies for Data Science. SMPS 2022. Advances in Intelligent Systems and Computing, (1433) 73-78.
- Cappozzo A., Casa A., Fop, M. (2021). Penalized model-based clustering for three-way data structures. Book of short papers - SIS 2021. ISBN: 978-88-9192-736-1.
- Fop M., Karlis D., Kosmidis I., O'Hagan A., Ryan C., Gormley I. C. (2019). Gaussian mixture models for high dimensional data using composite likelihood *CLADAG 2021 Book of Short Papers*, ISBN: 978-88-5518-340-6
- Cappozzo A., Casa A., Fop M. (2021). Model-based clustering with sparse matrix mixture models. *CLADAG 2021 Book of Short Papers*, ISBN: 978-88-5518-340-6
- D'Angelo S., Fop M. (2019). A latent space model for clustering in multiplex data. *CLADAG 2019* Book of Short Papers, ISBN: 978-88-8317-108-6.

- Rastelli R., Fop M. (2019). A stochastic blockmodel for network interaction lengths over continuous time. CLADAG 2019 Book of Short Papers, ISBN: 978-88-8317-108-6.
- Fop M., Murphy T. B., Hanlon, L. (2017). Model-based clustering of data with measurement errors. *CLADAG 2017 Book of Short Papers*, ISBN: 978-88-99459-71-0.

## SOFTWARE Advanced knowledge of the language for statistical computing R. Author of and contributor to the following packages:

- covglasso: Sparse covariance matrix estimation. [Link]
- · damda: Dimension-adaptive mixture discriminant analysis. [Link]
- expSBM: Exponential stochastic block model for interaction lengths. [Link]
- · LCAvarsel: Variable selection for latent class analysis. [Link]
- mclust: Gaussian finite mixture modelling. [Link]
- **mixggm**: Mixtures of Gaussian graphical models. [Link]
- · spaceNet: Latent space models for multivariate networks. [Link]

Additional software is available at my GitHub page.

ACADEMIC I am currently a **Named Supervisor** for the Science Foundation Ireland Center for Research Training (SFI CRT) *Foundations of Data Science*.

#### **Current PhD students**

- Noemi Corsini (visiting, University of Padova, co-supervision with Assoc. Prof. Giovanna Menardi) Stochastic block models for biographical networks
- Brian Hassett (co-supervision with Dr. Riccardo Rastelli) Latent position models for time-dependent multidimensional network data
- CJ Clarke
   Latent variable models for collections of networks
- Niyati Seth Optimization techniques for facility location problems for design of renewable energy communities
- Iuliia Promskaia (co-supervision with Dr. Adrian O'Hagan) Advances in latent variable models for multivariate and multidimensional networks
- Matt Nagle (co-supervision with Assoc. Prof. Aisling Ní Annaidh) Statistical and machine learning methods for tissue biomechanics data analysis
- Thais Pacheco (co-supervision with Prof. Brendan Murphy) Record linkage of historical census data
- Ganesh Babu (co-supervision with Prof. Claire Gormley) Model-based clustering and classification methods for hyperspectral images
- Gwee Xian Yao (co-supervision with Prof. Claire Gormley) Bayesian nonparametric models for network data

#### **MSc students**

I have supervised a number of MSc students working on research-oriented projects covering a range of methodological and applied topics, including statistical network analysis, model-based clustering, quantitative bias analysis.

#### Editorial ACTIVITY

#### Editorial board reviewer for the Journal of Machine Learning Research

Reviewer for a number of scientific journals in statistics and machine learning, including: Advances in Data Analysis and Classification, AISTATS, Annals of Applied Statistics, Bioinformatics, Biometrika, Computational Statistics and Data Analysis, Journal of Computational and Graphical Statistics, Journal of Statistical Software, Journal of the American Statistical Association, Journal of the Royal Statistical Society (Series A and C), Journal of Machine Learning Research, Pattern Recognition, Statistical Analysis and Data Mining, Statistics and Computing, Statistics in Medicine

#### **Committees and societies** ACADEMIC AND

#### PROFESSIONAL ACTIVITIES

Member of the executive committee of the Irish Statistical Association	2022 – Present
<ul> <li>Member of the scientific committee of the 7<sup>th</sup> MBC2 workshop</li> </ul>	2023-2024
<ul> <li>Member of the Equality, Diversity, and Inclusion (EDI) committee, UCD School of Mathematics and Statistics</li> </ul>	2022 – 2023
<ul> <li>Member of the programme committee of IC2S2 2021</li> </ul>	2021
• Founding chair of the Young Section of the Irish Statistical Association	2019 – 2021
PhD examination	
<ul> <li>Chair, Chaoyi Lu, Bayesian Strategies for Complex Statistical Models, supervisor Prof. Nial Friel, UCD</li> </ul>	2023
<ul> <li>External examiner, Edoardo Revivo, Modelling and Classification With Quantile Based Distributions, supervisor Prof. Cinzia Viroli, University of Bologna</li> </ul>	2023
<ul> <li>External examiner, Emiliano Seri, Advances in Model Based Clustering for the Social Sciences, supervisor Prof. Roberto Rocci, Sapienza University of Rome</li> </ul>	2022
<ul> <li>External examiner, Huynh Bao-Tuyen, Estimation and Feature Selection in High-Dimensional Mixtures-of-Experts Models, supervisor Prof. Faïcel Chamroul Université de Caen Normandie</li> </ul>	khi, <b>2019</b>
Miscellanea	
<ul> <li>Lead coordinator of the seminar series Statistics and Actuarial Science and Working Group in Statistical Learning of the UCD School of Mathematics and Statistics</li> </ul>	2019 – Present
• Research visit at Université de Caen Normandie (France)	2019
Membership to scientific societies	
American Statistical Association	

- Royal Statistical Society
- ISBA (International Society for Bayesian Analysis)
- Institute of Mathematical Statistics
- Irish Statistical Association

AWARDS AND	Charlemont Grant, Royal Irish Academy	2019
GRANTS	Classification Society Distinguished Dissertation Award, The Classification Society	2018
	Conference and Workshops Grant, Science Foundation Ireland	2016

#### PRESENTATIONS 2023

- Invited talk, Working Group on Model-based Clustering. CMU, Pittsburgh (USA)
- Invited seminar, Dep. of Statistical Sciences, University of Bologna (Italy)
- Invited plenary talk, Annual Research Day. University of Galway (Ireland)

#### 2022

- Talk, 6<sup>th</sup> Workshop MBC2. University of Catania (Italy)
- · Invited talk, Working Group on Model-based Clustering. Online
- Invited plenary talk, IFCS 2022. Porto University (Portugal)
- Invited seminar, Dep. di Economia ed Impresa, University of Catania (Italy)

#### 2021

- Invited talk, Working Group on Model-based Clustering. AEUB, Athens (Greece)
- Invited seminar, Mitchell Centre, University of Manchester (UK)
- Invited seminar, Dep. of Env. Sciences, Inform. and Statistics, Ca'Foscari Univ. of Venice (Italy)

#### 2020

- · Invited seminar, VistaMilk (Ireland)
- Invited seminar, DHLab, Université Côte d'Azur (France)

#### 2019

- Invited talk, CMStatistics 2019. University of London (UK)
- Invited seminar, LMNO, Université de Caen (France)
- Invited seminar, LMRS, Université de Rouen Normandie (France)
- Invited talk, CLADAG 2019. University of Cassino (Italy)
- · Invited talk, Working Group on Model-based Clustering. WU, Vienna (Austria)
- Talk, CASI 2019, Dundalk (Ireland)
- Invited seminar, Dep. of Mathematics and Statistics, Maynooth University (Ireland)
- Invited seminar, DHLab, Université Côte d'Azur (France)

#### 2018

- Invited talk, CMStatistics 2018. University of Pisa (Italy)
- Invited seminar, School of Mathematics, University of Bristol (UK)
- **Talk**, 5<sup>th</sup> Workshop MBC2. University of Catania (Italy)
- Invited talk, Working Group on Model-based Clustering. Univ. of Michigan, Ann Arbor (USA)
- Invited talk, Classification Society. Stony Brook University (USA)
- Invited seminar, Department of Statistical Sciences, La Sapienza (Italy)
- Talk, CASI 2018, Galway (Ireland)

#### 2017

- Invited talk, CLADAG 2017. University of Milano-Bicocca (Italy)
- Poster, Working Group on Model-based Clustering. Univ. of Perugia (Italy)
- Invited talk, SIS 2017. University of Florence (Italy)
- Talk, CASI 2017, Mullingar (Ireland)

#### 2016

- Talk, 4<sup>th</sup> Workshop MBC2. University of Catania (Italy)
- Invited talk, Working Group on Model-based Clustering. Paris (France)

#### 2015

- · Invited talk, CMStatistics 2015. University of London (UK)
- Poster, Working Group on Model-based Clustering. UW, Seattle (USA)

# TEACHING Lecturer for a number of Statistics and Machine Learning modules at undergraduate, postgraduate and PhD level, all involving a significant component of data programming (mainly in R).

### Courses thaugth in UCD

<ul> <li>Statistical Machine Learning (STAT30270/STAT40750)</li> <li>Machine Learning &amp; AI (STAT40970)</li> <li>Statistical Modelling (STAT10060)</li> <li>Data Modelling for Science (STAT20070)</li> <li>Advanced Biostatistics (STAT40430)</li> </ul>	2019 – Present 2019 – Present 2018 – 2019 2018 – 2019 2018 – 2019
Other courses	
<ul> <li>Statistical Machine Learning (PhD)</li> <li>Introduction to Statistical Network Analysis (PhD)</li> <li>Hands on R (PhD)</li> <li>Applied Model-based Clustering (PhD)</li> </ul>	2023 2022 - 2023 2020 - 2022 2019

Last edited: October 2023