

- 1. Personal Details** 10.12 Worsley Building,
University of Leeds,
Leeds, LS2 9JT www.samrelton.com
DOB: 1st March 1990 s.d.relton@leeds.ac.uk
Nationality: British
- 2. Education** **The University of Manchester** Sept 2011 – Sept 2014
– PhD in Numerical Analysis Supervisor: Nicholas J. Higham FRS
– Developing theory and devising algorithms for functions of matrices
– Algorithms used in MATLAB, the NAG library, and in SciPy
– Funded by ERC Advanced Grant MATFUN (267526)
- The University of Manchester** Sept 2008 – July 2011
– First class BSc in Mathematics
– Graduated top of year group (around 350 students)
- 3. Professional Experience** **The University of Leeds, Assoc. Prof. in Health Data Science** Nov 2022 – Present
– Analysis of routinely collected healthcare data to improve services and patient outcomes.
– Wide range of clinical areas: surgery, oncology, mental health, musculoskeletal etc.
– Use of advanced statistical modelling and machine learning techniques.
– Over £7M in research funding.
– Module leader for two MSc Health Informatics and Data Science courses.
– Wellcome Trust Institutional Strategic Support Fellowship (Dec 2018).
– Fellow of the Higher Education Authority (Dec 2019).
– Member of expert advisory group on secure high-performance computing.
– Member of interview panels and mock fellowship panels.
– Visiting positions at Univ. Bristol, Sheffield, and Tasmania.
- The University of Leeds, Senior Research Fellow** July 2017 – Nov 2022
- The University of Manchester, Postdoctoral Researcher** March 2016 – June 2017
– Design and implementation of high-performance linear algebra software to improve performance on extreme scale machines.
– Involves parallel programming, OpenMP, MPI, GPUs, and runtime systems for distributed memory computing.
– Funded by Horizon 2020 Project NLAFFET (671633).
- The University of Manchester, Postdoctoral Researcher** Oct 2014 – March 2016
– Developing theory and algorithms relating to functions of matrices.
– Ongoing interdisciplinary projects with Cheminformatics and Statistics groups in Machine Learning, Data Analysis, and Epidemiology.
– Funded by ERC Advanced Grant MATFUN (267526).
- Prozone, Statistical Modelling Project** Dec 2014 – Dec 2015
– Developing models and metrics to analyze performance in football with Ian McHale (Chair of Statistics in Sports at the Royal Statistical Society).
– Handling large data sets with high performance software in Python.
– Presenting technical ideas to a non-specialist audience.
- MathWorks, Software Consultancy Project** Oct 2014 – Dec 2014
– Replaced a number of MATLAB functions with state-of-the-art, high performance alternatives based on my research.
– Project delivered software that was incorporated into MATLAB 2015b onwards.

British Government

Summer 2010 and 2011

- Worked on stream data mining and geographical data visualisation involving mathematical analysis, high performance computer code and rigorous testing.
- Developed prototype software for end-users.
- Performed scalability analysis to increase data throughput.

4. Grants awarded**NIHR Programme Grant for Applied Research**

£2.5M, Dec 2022

- Building latent variable models for all main body systems.
- External validation of models in national datasets (CPRD / SAIL).
- Co-applicant leading the external validation of predictive and clustering models.

Heart Research UK NET Grant

£217k, June 2022

- Personalising pacemaker programming for optimal heart contractility.
- Cohort study with longitudinal data for statistical modelling.
- Co-applicant leading the design and analysis of the statistical workpackage.

NIHR AI for Multiple Long Term Conditions Award

£2.8M, Dec 2021

- Using AI models to prioritise deprescribing clinics, avoiding harmful patient outcomes.
- Explicit plans to implement within the Merseyside health economy by end of the project.
- Co-applicant leading the design and implementation of AI models used throughout.

NIHR Invention for Innovation Award

£460k, Dec 2021

- Designed AI-based models for the objective analysis of Parkinsonian tremor.
- Involves industrial partner (Aire Logic) and PPI work on use of AI within diagnosis.
- Co-applicant involved in design and implementation of the AI models and statistical analyses of model performance.

NIHR Health Services & Delivery Research Award

£1.3M, Sept 2021

- Investigating the reasons for certain patients becoming frequent attenders of A&E services, and analysing services designed to move these people onto more appropriate care pathways.
- Mixed-methods study involving national-scale data analyses and targeted interviews.
- Co-applicant involved in design and implementation of statistical analyses.

NIHR Health Services & Delivery Research Award

£660k, Mar 2020

- Evaluating the implementation and impact of palliative care services via national survey.
- Optimise palliative services to improve patient benefit.
- Co-applicant involved in design and analysis of the survey.

NIHR Health Technology Assessment Award

£549k, Sept 2019

- Awarded to further develop the electronic frailty index (eFI) and develop prognostic-decision models for targeting interventions for older people with frailty.
- Co-applicant responsible for cleaning and analysis of 3 large datasets on Univ. Leeds infrastructure.

Wellcome Trust ISSF Fellowship

£50k, Dec 2018

- Awarded 12 months of seed funding for the development of novel machine learning models for the prediction of musculoskeletal patient outcomes. This preliminary work will form the basis of a larger grant from e.g. MRC, NIHR, Wellcome Trust, EPSRC.

NVIDIA Academic Seed Grant

2016, 2017, 2019

- Awarded three NVIDIA GPU grants to accelerate my research on machine learning and healthcare analytics, and my prior work in high-performance computing.

5. Teaching Experience**The University of Leeds**

2017–Present

- Redesigned MSc Health Informatics with Data Science course to re-align with NIHR

Academy training needs and increase intake from quantitative backgrounds (Maths, Statistics, Computer Science, etc.)

- Module leader for "Statistics and Modelling for Health Sciences". Created and delivered content on designing and evaluating regression models using real-world healthcare data.
- Module leader for "Artificial Intelligence and Machine Learning in Health". Created and delivered content on pragmatic use of AI models within healthcare, focusing on robust evaluation and changing clinical workflow - typically not covered within a computer science module.

The University of Leeds

2019–Present

- Lead PhD supervisor for two students from the School of Computing CDT in Medical AI for Diagnosis.
- PhD co-supervisor to ST5 Neurology trainee at St. James Hospital, Leeds.
- PhD co-supervisor to student in palliative care group, LIHS.
- Statistical advisor for 7 students in various NIHR/MRC clinical fellowships.
- Thesis adviser for 8 MSc students from School of Mathematics.

The University of Manchester

Semester 1, 2015/16, 2016/17.

- Designed and delivered lectures on linear algebra for electronic engineering students (around 250 registered). Also ran a weekly tutorial session, wrote the course exam, and marked it.

The University of Manchester

Sept 2011 – Sept 2014

- Ran tutorial sessions for around 20 students of MATH10202 (Linear Algebra) revising course material and working through examples they find difficult on the blackboard. This also involved regularly marking their work and giving them personal feedback.

The University of Manchester

Sept 2011 – Sept 2014

- Postgraduate helper for MATH10001 (Math Workshop) supporting students in learning MATLAB and performing various group exercises. This involved regular marking of their group projects and giving feedback to each individual on how their mathematical writing could be made more eloquent.

6. PhD Students

- Stefan Williams (2019–2023)
- Jacqueline Birtwhistle (2021–)
- Zoe Hancox (2021–)
- Benjamin Keel (2022–)

7. Honours and Awards

Visiting Academic at Universities of Bristol, Sheffield, and Tasmania 2021–Present

- Secondary analysis of the RESPOND trial with Dr Emily Henderson (Bristol).
- Access to CURED data on hospital attendances for secondary analyses (Sheffield).
- Access to TAS-TEST, a large longitudinal cohort of patients with neurological disorders (Tasmania).

Fellow of the Higher Education Authority

2019

- Awarded for recognition of teaching quality, and my commitment to continual improvement of my teaching approach.

SIAM Student Chapter Certificate of Recognition

2013

- Awarded for outstanding contributions to the SIAM Student Chapter Programme by pioneering the SIAM National Student Chapter Conference in the UK.

The University of Manchester Outstanding Academic Achievement Award

2011

- Awarded to 5 students from the Electronic and Physical Sciences faculty for outstanding

undergraduate performance.

IMA Award for Undergraduate Achievement 2011
– Awarded for best undergraduate degree in the School of Mathematics.

The University of Manchester John Dalton Scholarship 2009 and 2010
– Attained best average exam score in the School of Mathematics each year.

8. Professional Activities

Working Group: NIHR Incubator Workstream in Health Data Science 2021–Present
– Founding member of group aiming to improve the quality of research and career trajectory of health data scientists.

– Run webinars discussing strength and limitations of cutting edge methodologies to a national audience.

https://www.youtube.com/playlist?list=PLN_0Ti0CbJlp_zK3vin-mIHqrB3QkIov

Seminar Organiser: Leeds Institute of Data Analytics Predictive Modelling and Study Design Seminar 2021–Present

– Organiser of monthly seminar series with variety of internationally renowned speakers
– Over 120 people on the mailing list

Seminar Organiser: Leeds Institute of Health Sciences PGR Seminar 2019 – 2020
– Faculty adviser for student-led seminar series

Seminar Organiser: Data in Applied Health Research 2017 – 2020
– Responsible for finding and inviting speakers

Seminar Organiser: Numerical Analysis and Scientific Computing 2015 – 2017
– Responsible for inviting and entertaining seminar speakers
– Budget management required for reimbursing travel and entertaining the speakers

Manchester SIAM Student Chapter President 2011 – 2014
– Organised the inaugural SIAM National Student Chapter Conference (SNSCC12)
– Arranged an annual conference in Manchester each year
– Ran an afternoon of talks with guest speaker Prof. J. Dongarra
– Managed our annual budget and helped secure funding from NAG and the department

Blog (URL: blog.samrelton.com) 2013 – Present
– Summary of conferences I've attended and repository of useful information

Github (URL: github.com/sdrelton) 2014 – Present
– Contains open source code I have wrote that others may want to use

9. Refereeing

I have refereed for the following grant committees:

- UKRI Programme Grants
- NIHR Programme Grants and Final Reports

I have also referred for the following journals:

- British Medical Journal
- Trends in AI
- Frontiers in Cardiovascular Heart Disease
- Frontiers in Artificial Intelligence
- Transactions on Medical Imaging
- European Journal of Operations Research
- IMA Journal of Management Mathematics
- SIAM Journal of Matrix Analysis and its Applications
- SIAM Journal of Scientific Computing

- Electronic Journal of Linear Algebra
- Internet Mathematics
- Linear Algebra and its Applications
- Numerical Algorithms
- Applied Mathematics and Computation
- Computer Physics Communications
- Journal of Quantitative Analysis in Sports

10. Industrial Collaborations

- Roche funded research project (approx £150k) to investigate the real-life impact of drugs to treat wet age-related macular degeneration, in the presence of patient dropout, site-related differences in treatment and non-persistence to treatment schedules etc. Successfully completed in 2021.
- AireLogic are co-applicants on an NIHR i4i grant, due to start in September 2022 (£460k). They are responsible for translating AI models into a smartphone application to help neurologists assess the severity of patient tremor.
- Intel, NVIDIA, and ARM use linear algebra code developed during my time at Manchester as the basis for their MKL, CuBLAS, and ARM Performance libraries, respectively.
- MATLAB use algorithms designed during my PhD for the computation of the matrix logarithm, and square root.

11. Authored Software

- Core developer of the Batched BLAS (Basic Linear Algebra Subprograms).
- Core developer of the PLASMA linear algebra project targeting multi-core systems.
- Functions for the matrix square root, logarithm, and exponential, incorporated into MATLAB 2015b onwards.
- Computation of the matrix logarithm, its derivatives, and condition number, MATLAB File Exchange.
- Computation of the matrix sine and cosine functions, Github.
- Function to generate performance profile graphs in Python, Github.

12. Programming Languages

- Very familiar with MATLAB, Python, and R for use in scientific computing, data analysis, and machine learning applications.
- Familiar with C and CUDA for high-performance computing.
- Comfortable using HTML and CSS to produce websites from scratch.
- Previous experience using Java, C++, Perl, and Javascript.

13. Publications

- [1] J. Birtwistle, P. Millares-Martin, C. J. Evans, R. Foy, S. D. Relton, S. Richards, K. E. Sleeman, M. Twiddy, M. I. Bennett, M. J. Allsop. *Mapping and characterising electronic palliative care coordination systems and their intended impact: A national survey of end-of-life care commissioners* PloS One 17(10), e0275991.
- [2] R. Li, R. J. St. George, X. Wang, K. Lawler, E. Hill, S. Garg, S. Williams, S. D. Relton, D. Hogg, Q. Bai, J. Alty. *Moving towards intelligence telemedicine: Computer vision measurement of human movement* Computer in Biology and Medicine, 105776, 2022.
- [3] Samuel D. Relton, Gloria C. Chi, Robert M. West, Martin McKibbin. *Associations with visual acuity outcomes after 12 months of treatment in 9401 eyes with neovascular AMD*. BMJ Open Ophthalmology 7(1), e001038, 2022.
- [4] Stefan Williams, Clea Southall, Samantha Haley, Thamer Ba Dhafari, Steven Kemp, Samuel D. Relton, Jane E. Alty, Owen Johnson, Christopher D. Graham, Melissa Maguire. *To the emergency room and back again: Circular healthcare pathways for acute functional neurological disorders*. Journal of the Neurological Sciences (120251), 2022.
- [5] Z. Zhao, D. Murphy, H. Gifford, S. Williams, A. Darlington, S. D. Relton, H. Fang, D. Wong. *Analysis of an adaptive lead weighted ResNet for multiclass classification of 12-lead ECGs*. Physiological Measurement 43(3), 2022.

- [6] Yousuf El Mokhallalati, Enas Alaloul, Mohammed Shatat, Tasneem Shneewra, Saad El Massri, Omar Shaer, Samuel Relton, Hammada Abu-Odah, Matthew J Allsop. *The Symptom Burden and Quality of Life in Cancer Patients in the Gaza Strip, Palestine: A Cross-Sectional Study*. PLOS One, 17(1), 2022.
- [7] Peter Kandolf, Antti Koskela, Samuel D Relton, Marcel Schweitzer. *Computing lowrank approximations of the Frchet derivative of a matrix function using Krylov subspace methods*. Numerical Linear Algebra with Applications, 28(6), e2401, 2021.
- [8] Sam Straw, Melanie McGinlay, Michael Drozd, Thomas A Slater, Alice Cowley, Stephe Kamalathanan, Nicholas Maxwell, Rory A Bird, Aaron O Koshy, Milos Prica, Peysh A Patel, Samuel D Relton, John Gierula, Richard M Cubbon, Mark T Kearney, Klaus K Witte. *Advanced care planning during the COVID-19 pandemic: ceiling of care decisions and their implications for observational data*. BMC Palliative Care, 20(1), 1–11, 2021.
- [9] Zuogang Shang, Zhibin Zhao, Hui Fang, Samuel Relton, Darcy Murphy, Zoe Hancox, Ruqiang Yan, David Wong. *Deep Discriminative Domain Generalization with Adversarial Feature Learning for Classifying ECG Signals*. Computing in Cardiology, 48, 1–4, 2021.
- [10] M. Drozd, Samuel D. Relton, et al. *Association of chronic heart failure and its comorbidities with loss of actuarially predicted life expectancy: a prospective cohort study* BMJ Heart, 107(17), 1417–1421, 2021.
- [11] Melanie McGinlay, Sam Straw, Rowenna Byrom-Goulthorp, Samuel D Relton, John Gierula, Richard M Cubbon, Mark T Kearney, Klaus K Witte. *Suboptimal Dosing of -Blockers in Chronic Heart Failure: A Missed Opportunity?* Journal of Cardiovascular Nursing, 2021.
- [12] Daniel Romeu, Elspeth Guthrie, Carolyn Czoski-Murray, Samuel Relton, Andrew Walker, Peter Trigwell, Jenny Hewison, Robert West, Mike Crawford, Matt Fossey, Claire Hulme, Allan House. *Experiences of people seen in an acute hospital setting by liaison mental health services: responses from an online survey*. BJPpsych Open, 7(S1), S346, 2021.
- [13] Saafi Mousa, Gary Latchford, Anna Weighall, Hannah Nash, Rebecca Murray-Leslie, Markus Reuber, Samuel D. Relton, Christopher D. Graham. *Evidence of objective sleep impairment in nonepileptic attack disorder: A naturalistic prospective controlled study using actigraphy and daily sleep diaries over six nights*. Epilepsy & Behaviour, 117, 107867, 2021.
- [14] V. Rusius, Samuel D. Relton, C. Qin, C. Ashton, S. Young, E. MacInnes, N. Sharma. *Mammographic volume can be used to estimate mastectomy weight*. European Journal of Surgical Oncology, 47(5), e344, 2021.
- [15] Stefan Williams, Hui Fang, Samuel D. Relton, Christopher Graham, Jane Alty. *Seeing the unseen: Could Eulerian video magnification aid clinician detection of subclinical Parkinson’s tremor?* Journal of Clinical Neuroscience, 81, 101–104, 2020.
- [16] Zhibin Zhao, Hui Fang, Samuel D. Relton, R. Yan, Z. Li, J. Qin, David Wong. *Adaptive lead weighted resnet trained with different duration signals for classifying 12-lead ECGs*. Computing in Cardiology, 1–4, 2020.
- [17] Stefan Williams, Hui Fang, Samuel D. Relton, David Wong, Taimour Alam, Jane Alty. *Accuracy of smartphone video for contactless measurement of hand tremor frequency*. Movement Disorders Clinical Practice, 2020.
- [18] Sam Straw, Melanie McGinlay, Samuel D Relton, et al. *Effect of disease modifying agents and their association with mortality in multi-morbid patients with heart failure with reduced ejection fraction*. ESC Heart Failure, 2020.
- [19] David C. Wong, Samuel D. Relton, Hui Fang, Stefan Williams, Jane Alty, Rami Qhawaji, and Chistopher D. Graham *Supervised classification of bradykinesia in*

Parkinson's disease diagnosis from smartphone videos. Artificial Intelligence in Medicine, 101966, 2020.

- [20] Zhibin Zhao, Hui Fang, Stefan Williams, Samuel D. Relton, Jane Alty, A.J. Casson, David C. Wong. *Time series clustering to examine presence of decrement in Parkinsons finger-tapping bradykinesia* 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 780–783, 2020.
- [21] Stefan Williams, Zhibin Zhao, Awais Hafeez, David C. Wong, Samuel D. Relton, Hui Fang, Jane E. Alty. *The discerning eye of computer vision: Can it measure Parkinsons finger tap bradykinesia?* Journal of the Neurological Sciences, 417(117003), 2020.
- [22] D. C. Wong, S. D. Relton, V. Lane, M. Ismail, V. Goss, J. Bytheway, R. M. West, J. Deuchars, J. Sutcliffe, *Bedside Breath Tests in Children with Abdominal Pain: a Prospective Pilot Feasibility Study.* BMC Pilot and Feasibility Studies, *Accepted*.
- [23] P. C. Jackson, E. G. MacInnes, J. K. Nicholson, I. Brayshaw, S. D. Relton, and R. Achuthan, *Mastectomy Without Drains Reduces Cost with No Detriment to Patient Outcome.* Cureus, 11(7):e5160, 2019.
- [24] J. Dongarra, M. Gates, A. Haidar, J. Kurzak, P. Luszczek, P. Wu, I. Yamazaki, A. Yarkhan, M. Abalenkovs, N. Bagherpour, S. Hammarling, J. Šístek, D. Stevens, M. Zounon, S. D. Relton, *PLASMA: Parallel Linear Algebra Software for Multicore Using OpenMP.* ACM TOMS, 45(2):35pp, 2019.
- [25] Ian McHale, and Samuel D. Relton. *Identifying Key Players in Soccer Teams using Network Analysis and Pass Difficulty.* European Journal of Operational Research, 268(1):339–347, 2018.
- [26] Peter Kandolf, and Samuel D. Relton. *A Block Krylov Method to Compute the Action of the Fréchet Derivative of a Matrix Function on a Vector with Applications to Condition Number Estimation.* SIAM J. Sci. Comput., 39(4):A1416–A1434, 2017.
- [27] Jack Dongarra, Sven Hammarling, Nicholas J. Higham, Samuel D. Relton, and Mawussi Zounon. *Optimized Batched Linear Algebra for Modern Architectures* Proceedings of Euro-Par 2017, Spain, 511–522, 2017.
- [28] Jack Dongarra, Sven Hammarling, Nick Higham, Samuel Relton, Pedro Valero-Lara, and Mawussi Zounon. *The Design and Performance of Batched BLAS on Modern High-Performance Computing Systems.* Proceedings of ICCS 2017, Switzerland.
- [29] Ian G. McHale, and Samuel D. Relton. *Player Ratings in Soccer* Handbook of Statistical Methods and Analyses in Sports. Chapter 19, 2017.
- [30] Nicholas J. Higham and Samuel D. Relton. *Estimating the Largest Elements of a Matrix.* SIAM J. Sci. Comput., 38(5):C584–C601, 2016.
- [31] Jack Dongarra, Iain Duff, Mark Gates, Azzam Haidar, Sven Hammarling, Nicholas J. Higham, Jonathon Hogg, Pedro Valero-Lara, Samuel D. Relton, Stanimire Tomov, and Mawussi Zounon *A Proposed API for Batched Basic Linear Algebra Subproblems.* MIMS EPrint 2016.25
- [32] Edvin Deadman and Samuel D. Relton. *Taylor's Theorem for Matrix Functions with Applications to Condition Number Estimation.* Linear Algebra Appl., 504:354–371, 2016.
- [33] Wayne Arter, J. Guy Morgan, Samuel D. Relton, and Nicholas J. Higham. *Ranking the Importance of Nuclear Reactions for Activation and Transmutation Events.* Nuclear Science and Engineering, 2015.
- [34] A. H. Al-Mohy, Nicholas J. Higham, and Samuel D. Relton. *New Algorithms for Computing the Matrix Sine and Cosine Separately or Simultaneously.* SIAM J. Sci. Comput., 37(1):A456–A487, 2015.
- [35] Nicholas J. Higham and Samuel D. Relton. *Estimating the Condition Number of the Fréchet Derivative of a Matrix Function.* SIAM J. Sci. Comput., 36(6):C617–C634, 2014.

- [36] Nicholas J. Higham and Samuel D. Relton. *Higher Order Fréchet Derivatives of Matrix Functions and the Level-2 Condition Number*. SIAM J. Matrix Anal. Appl., 35(3):1019–1037, 2014.
- [37] A. H. Al-Mohy, Nicholas J. Higham, and Samuel D. Relton. *Computing the Fréchet Derivative of the Matrix Logarithm and Estimating the Condition Number*. SIAM J. Sci. Comput., 35(4):C394–C410, 2013.

14. Conferences Organised Annual Manchester SIAM Student Chapter Conference 2014, 2nd May 2014, University of Manchester.

Annual Manchester SIAM Student Chapter Conference 2013, 20th May 2013, University of Manchester.

SIAM National Student Chapter Conference 2012 (SNSCC12), 18th May 2012, University of Manchester.

An afternoon of talks with Jack Dongarra and David Silvester, 3rd Aug 2012, University of Manchester.

15. Minisymposia Organised SIAM Conference on Computational Science and Engineering 2017, *Batched Linear Algebra on Multi/Many-Core Architectures*, 27 Feb – 3 March 2017, Atlanta, Georgia, USA.

SIAM Conference on Computational Science and Engineering 2017, *Recent Advances in Matrix Functions and Applications*, 27 Feb – 3 March 2017, Atlanta, Georgia, USA.

SIAM Conference on Applied Linear Algebra 2015, *Recent Advances in Matrix Functions*, 26–30 October 2015, Atlanta, Georgia, USA.

IMA Numerical Linear Algebra and Optimization 2014, *Modern directions in matrix analysis and applications*, 4th September, 2014, University of Birmingham.

16. Invited Talks Patient Reported Outcomes in Cancer Research Workshop – Technical Talk, 31st March 2020. Title: *Dynamic Survival Predictions using Joint Models*

Numerical Algorithms Group – Technical Talk, 1st April 2020. Title: *AI in Medicine - Exploiting Structured Temporal Information with Graph-based Machine Learning*

Machine Learning Forum, 5th December 2017, University of Leeds, Leeds. Title: *Advances in Batched Linear Algebra for Machine Learning*

Computational Science and Engineering Seminar, 17th November 2017, University of Leeds, Leeds. Title: *The History (and Future!) of BLAS*

ARC-HPC User Group Meeting, 17th October 2017, University of Leeds, Leeds. Title: *Task-based Linear Algebra on the Intel KNL*

Data in Applied Health Research Seminar, 27th September 2017, University of Leeds, Leeds. Title: *HPC and Machine Learning in Healthcare Research*

Applied Mathematics Seminar, 6th October 2016, ETH Stockholm, Sweden. Title: *Estimating the Largest Elements of a Matrix*.

Computational Mathematics and Applications Seminar, 12th May 2016, RAL STFC, Oxford. Title: *Estimating the Largest Elements of a Matrix*.

- 17. Conferences Participated** Foundations of Intelligence Systems: 26th International Symposium (ISMIS) 2022, 3–5 October, 2022, Cosenza, Italy. Talks: *Temporal Graph-Based CNNs (TG-CNNs) for Online Course Dropout Prediction*.
- Computer Based Medical Systems (CMBS) 2019, 5–7 June, 2019, Cordoba, Spain. Talks: *Supervised classification of bradykinesia for Parkinson’s disease diagnosis from smartphone videos*.
- SIAM Computational Science and Engineering, 27 Feb – 3 March, 2017, Atlanta, Georgia, USA. Talk: *On the Computation of the Action of the Fréchet Derivative*.
- Workshop on Batched, Reproducible, and Reduced Precision BLAS, 23–25 February, 2017, Georgia Tech, Atlanta, Georgia, USA. Talk: *Standardizing the Batched BLAS API and Memory Layout*.
- 4th Workshop on Sustainable Software for Science: Practice and Experiences, 12–14 September, 2016, The University of Manchester. Talk: *Creating a Standardised Set of Batched BLAS Routines*.
- IMA Numerical Linear Algebra and Optimization 2016, 7–9 September, 2016, University of Birmingham. Talk: *A Block Krylov Method for the Fréchet Derivative of $f(A)b$* .
- SIAM Conference on Applied Linear Algebra, 26–30 October, 2015, Atlanta, USA. Talk: *Taylor’s Theorem for Matrix Functions and Pseudospectral Bounds on the Condition Number*.
- New Directions in Numerical Computing, 25–28 August, 2015, University of Oxford, England. Talk: *Componentwise and Mixed Condition Numbers for Matrix Functions*.
- 26th Biennial Numerical Analysis Conference, 23–26 June 2015, University of Strathclyde, Glasgow, Scotland. Talk: *Taylor’s Theorem for Matrix Functions and Pseudospectral Bounds on the Condition Number*
- SIAM Conference on Computational Science and Engineering 2015, 14–18 March 2015, Salt Lake City, Utah. Poster: *Componentwise Sensitivity of Matrix Functions and Applications*
- IMA Numerical Linear Algebra and Optimization 2014, 3–5 September 2014, University of Birmingham. Talk: *Fréchet Derivatives of Matrix Functions and Applications*
- Prague SIAM Student Chapter Meeting 2014, 21st March 2014, Prague, Czech Republic. Talk: *The Elementwise Sensitivity of Matrix Functions*
- SIAM Gene Golub Summer School 2013, July 2013, University of Shanghai. Talk: *Higher Order Fréchet derivatives of a Matrix Function and Applications*
- SIAM Annual Meeting 2013, 9th July 2013, San Diego, USA. Talk: *Higher Fréchet Derivatives of Matrix Functions and some Applications*
- SIAM National Student Chapter Conference 2013, 10th May 2013, University of Warwick. Talk: *Higher Fréchet Derivatives of Matrix Functions and some Applications* Poster: *Computing the Matrix Logarithm and its Condition Number (Awarded best poster prize)*
- FUN13: Advances in Matrix Functions and Matrix Equations, 10–12 April 2013, University of Manchester. Talk: *Higher Fréchet Derivatives of Matrix Functions and some Applications* Poster: *Computing the Matrix Logarithm and its Condition Number*

Cardiff SIAM Student Chapter Day, 21st Jan 2013, University of Cardiff. Poster: *Computing the Matrix Logarithm and its Condition Number*

SIAM UKIE Annual Meeting, 8th Jan 2013, University of Reading. Poster: *Computing the Matrix Logarithm and its Condition Number*

IMA 3rd Conference on Numerical Linear Algebra and Optimization, 10–12 Sept 2012, University of Birmingham. Talk: *An Algorithm to Compute the Matrix Logarithm and its Fréchet Derivative for use in Condition Number Estimation*

SIAM Conference on Applied Linear Algebra, 18–22 June 2012, University of Valencia. Talk: *An Algorithm to Compute the Matrix Logarithm and its Fréchet Derivative for use in Condition Number Estimation*

18. Memberships

I am a member of the following professional bodies:

- SIAM Postdoctoral Member
- IMA Associate Member
- ILAS Student Member

19. Courses Attended

Statistical Methods for Risk Prediction and Prognostic Models, 8–10 January 2020, University of Keele.

Causal Inference Summer School, 8th – 12th July 2019, University of Leeds.

Python and TAU (Tuning and Analysis Utilities) for HPC, 2nd July 2015, University of Manchester.

Beginner and Intermediate Fortran (Online courses), University of Manchester.

Software Carpentry Bootcamp, 14th January 2014, University of Manchester.

Introduction to OpenMP, 15th November 2013, University of Manchester.

SIAM Gene Golub Summer School on Matrix Functions and Matrix Equations, 22 July – 2 August 2013, Fudan University, Shanghai. *Attendance by application only with funding provided by the organizing committee.*

NATCOR PhD Course on Convex Optimization, 28th June – 2nd July 2012, Brunel University.