## Curriculum Vitae, Prof. Dr Raphael Hauser

#### Contact

- Address: Mathematical Institute; University of Oxford; Andrew Wiles Building; Radcliffe Observatory Quarter; Woodstock Road; Oxford OX2 6GG; United Kingdom.
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- LinkedIn: http://uk.linkedin.com/pub/raphael-hauser/0/691/837

#### Education

- Aug 1995 Aug 1999: CORNELL UNIVERSITY, Ithaca (NY, USA). School of Operations Research & Industrial Engineering: Ph.D. in Operations Research. supervisor: Prof. Michael J. Todd. Thesis: "Search Directions for Self-Scaled Conic Programming". Major in mathematical programming, minors in computer science and applied probability.
- ◊ Oct 1989 June 1993: SWISS FEDERAL INSTITUTE OF TECHNOLOGY (ETH), Zurich (Switzerland). Department of Mathematics: Dipl. Math. ETH. Thesis supervisor: Prof. Corneliu Constantinescu. Thesis: "Smallest Faithful Representations of *C*\*-Algebras". Specialisation areas: analysis, geometry, algebra, theoretical physics.

#### Academic Employment History

- Sep 2016 present: ALAN TURING INSTITUTE OF DATA SCIENCE, The National Institute for Data Science and Artificial Intelligence, London, UK. Alan Turing Fellow.
- ◊ Jan 2014 present: UNIVERSITY OF OXFORD, Oxford, UK. Associate Professor of Numerical Mathematics (tenured), Mathematical Institute.
- Sept 2009 Dec 2013: UNIVERSITY OF OXFORD, Oxford, UK. Reader in Mathematical Programming (tenured), Mathematical Institute.
- ◊ June 2006 Aug 2009: UNIVERSITY OF OXFORD, Oxford, UK. Reader in Mathematical Programming (tenured position). Oxford University Computing Laboratory.
- Sept 2001– May 2006: UNIVERSITY OF OXFORD, Oxford, UK. University Lecturer in Numerical Analysis. Oxford University Computing Laboratory.
- Sept 2001–present: PEMBROKE COLLEGE OXFORD, Oxford, UK. Tanaka Fellow in Applied Mathematics (tenured since 2006), Senior Mathematics Tutor.
- Aug 1999–Aug 2001: UNIVERSITY OF CAMBRIDGE, Cambridge, UK. Postdoctoral Research Associate at the Department of Applied Mathematics and Theoretical Physics (DAMTP).
- ◊ Sept 1995–Aug 1999: CORNELL UNIVESITY, Ithaca, USA. Teaching Assistant.
- ◊ Sept 1993 Aug 1995: ETH ZURICH, Zurich, Switzerland. Teaching Assistant.
- ◊ Aug 1991 July 1993: ABENDTECHNIKUM DER INNERSCHWEIZ, Lucerne, Switzerland. Lecturer.

#### Industrial Collaborations and Consultancies:

- Culham Centre for Fusion Energy, Culham, UK: time parallel algorithms for tokamak simulation. Supervision of doctoral research project. May 2018 – present.
- Siemens Power Systems, Muelheim an der Ruhr, Germany: Blade path optimization in steam turbine design.
   Supervision of doctoral research project. May 2017 present.



- The Emirates Group, Dubai, UAE: network revenue management, Jan 2016 present. Supervision of postdoctoral research project.
- Adaptix Ltd., Begbroke, UK: development of tomographic image reconstruction algorithm for X-ray micro emitter array imaging system. 2013 – present. Supervision of 2 postdoctoral projects and 1 DPhil research project (ongoing). 3 patent applications, of which one has been granted to date.

#### Skills

- Peer-reviewed research in data science, mathematical optimization and applied probability.
- ◊ Experienced graduate supervisor.
- Inventor and author of patents in data science and medical imaging.
- ◊ Track record in securing research funding.
- Curriculum development and lecturing undergraduate, masters and PhD level courses in mathematics, statistics and computer science.
- ◊ Experienced internal and external examiner, director of graduate studies, university administration.
- ◊ Solving industrially focussed problems in data science and scientific computing with proven impact.
- Languages: quasi-native fluency in German, English and French; intermediate fluency in Italian, Portuguese and Russian; basic fluency in Spanish.

#### Honours

- ◊ Alan Turing Fellow, ATI London, UK.
- ◊ Scientific Advisory Board at COMCOM Ltd., Slovenia, 2017 present.
- ◊ Scientific Advisory Board at Exabel AS, Norway, 2016 present.
- ◊ Scientific Advisory Board at Adaptix Ltd., UK, 2013 present.
- ◊ EPSRC Peer Review Panel member.
- ◊ Oxford University Teaching Award, 2007.
- 2005 SIAM Activity Group on Optimization Prize for the paper, "The Nesterov-Todd Direction and Its Relation to Weighted Analytic Center" (Foundations of Computational Mathematics, 1-40, 2004).
- 2000 SIAM Student Paper Prize for the paper "Target Directions for Primal-Dual Interior-Point Methods for Self-Scaled Conic Programming".

#### References

- ◊ Professor Felipe Cucker (macucker@math.cityu.edu.hk), Dept of Mathematics, City University of Hong Kong.
- ◊ Professor James Renegar (renegar@orie.cornell.edu), School of OR&IE, Cornell University
- ◊ Professor Michael J. Todd (miketodd@cs.cornell.edu), Emeritus, School of OR&IE, Cornell University.

# Publications (Orcid 0000-0002-1166-5329)

### **Book Chapters**

- R.A. Hauser, A. Eftekhari and H. Matzinger. "PCA by Determinant Optimization has no Spurious Local Optima". KDD 2018. arXiv:1803.04049 [math.OC].
- R. Hauser and M. Klodt. "Nonlinear Compressed Sensing for Multi-Emitter X-Ray Imaging". Springer International Publishing AG 2016, E. Hancock et al. (Eds.): EMMCVPR 2017 Revised Selected Papers. LNCS 10746, 189–204, 2018. DOI: 10.1007/978-3-319-78199-0.
- R.A. Hauser and M. Klodt. "3D Image Reconstruction from X-Ray Measurements with Overlap". Springer International Publishing AG 2016, B. Leibe et al. (Eds.): ECCV 2016, Part VI, LNCS 9910, 19–33, 2016. DOI: 10.1007/978-3-319-46466-4 2
- R.A. Hauser, S. Shahverdyan and P. Embrechts. "A General Duality Relation with Applications in Quantitative Risk Management". Chapter 22 in "Innovations in Quantitative Risk Management", Springer Verlag, 2014. DOI 10.1007/978-3-319-09114-3\_22
- E. Amaldi, P. Belotti and R. Hauser. "A randomized algorithm for the MaxFS problem". Integer Programming and Combinatorial Optimization: 11th International IPCO Conference, Berlin, Germany, June 8-10, 2005. Proceedings *Lecture Notes in Computer Science*, Volume 3509 / 2005, 249 – 264. Editors: Michael Jünger, Volker Kaibel. Springer-Verlag GmbH, ISSN: 0302-9743. DOI: 10.1007/11496915\_19

#### Journal Articles

- A. Eftekhari, R.A. Hauser and Andreas Grammenos. "MOSES: A Streaming Algorithm for Linear Dimensionality Reduction". arXiv:1806.01304 [cs.IT], 2018. Submitted to IEEE Transactions on Pattern Analysis and Machine Intelligence.
- R.A. Hauser and A. Eftekhari. "PCA by Optimisation of Symmetric Functions has no Spurious Local Optima". arXiv:1805.07459 [math.OC]. 2018. Submitted to SIAM Journal on Optimization.
- ◊ G. Simões, M. McDonald, S. Williams, D. Fenn, R.A. Hauser. "Robust Portfolio Optimisation with Specified Competitors". Quantitative Finance, 2018, 1–13. https://doi.org/10.1080/14697688.2018.1453940
- R.A. Hauser, J. Lember, H.F. Matzinger, and R. Kangro. "Quantifying the Estimation Error of Principal Components". Submitted to Information and Inference: A Journal of the IMA, 2018. arXiv:1710.10124[math.ST].
- R.A. Hauser, I. Popescu and H.F. Matzinger. "An Upper Bound on the Convergence Rate of a Second Functional in Optimal Sequence Alignment". arXiv:1409.7713. Bernoulli 2018, Vol. 24, No. 2, 971–992. DOI 10.3150/16-BEJ823.
- R.A. Hauser and H. Matzinger. "Microscopic path structure of optimally aligned random sequences". To appear in *Bernoulli*, 2018, 30 pages.
- R.A. Hauser and H. Matzinger. "Supplement: Microscopic Path Structure of Optimally Aligned Random Sequences". To appear in *Bernoulli*, 2018, 15 pages.
- M. Troha and R.A. Hauser. "The Impact of Startup Costs and the Grid Operator on the Power Price Equilibrium". arXiv:1412.0148. Under review, Energy Economics.
- M. Troha and R.A. Hauser. "Calculation of a term structure power price equilibrium with ramping constraints". *Journal of Energy Markets*, Vol. 8, No. 4 (Dec 2015), 23–68. DOI: 10.21314/JEM.2015.134. ISSN: 1756-3607 (print).
- ◊ S. Amsalu, R. Hauser and H. Matzinger. "A Monte Carlo Approach to the Fluctuation Problem in Optimal Alignments of Random Strings. *Markov Processes and Related Fields*, Vol. 20, No. 1 (2014), 107 –144.
- R.A. Hauser and H. Matzinger. "Letter Change Bias and Local Uniqueness in Optimal Sequence Alignments". J. Stat. Phys., Vol 153, No. 3 (2013), 512–529. DOI 10.1007/s10955-013-0819-4.
- ◊ F. Cucker, M. Lotz and R.A. Hauser. "Adversarial Smoothed Analysis", J. Complexity 26 (2010), no. 3, 255–262.
- R.A. Hauser and T. Müller. "Conditioning of random conic systems under a general family of input distributions", Found. Comput. Math. Vol. 9, No. 3. (2009), 335–358.
- C. Dürringer, R.A. Hauser and H. Matzinger. "Upper bounds on the mean curve in the LCS problem". Stochastic Processes and their Applications 118 (2008), 629–648.

- R.A. Hauser and J. Nedić. "On the relationship between convergence rates of discrete and continuous dynamical systems", *SIAM J. Optim.* 18 (2007), no. 1, 52–64.
- R.A. Hauser, S. Martinez and H. Matzinger. "Large deviations based upper bounds on the expected relative length of longest common subsequences", *Advances in Applied Probability* 38 (3), 827–852. September 2006.
- R.A. Hauser and E. Amaldi. "Boundedness Theorems for the Relaxation Method". Math of OR 30 (2005), no. 4, 939–955. DOI: 10.1287/moor.1050.0164.
- R.A. Hauser and J. Nedić. "The continuous Newton-Raphson method can look ahead". SIAM J. Optim. 15 (2005), no. 3, 915–925.
- ◊ D. Cheung, F. Cucker and R.A. Hauser. "On Tail Decay and Moment Estimates of a Condition Number for Random Linear Conic Systems". SIAM J. Optim. 15 (2005), no. 4, 1237–1261.
- R.A. Hauser. "The Nesterov–Todd direction and its relation to weighted analytic centers". *Found. Comput. Math.* 4 (2004) no. 1, 1–40. Winner of the 2005 SIAM Activity Group on Optimization Prize.
- R.A. Hauser and Y. Lim. "Self-scaled barriers for irreducible symmetric cones". SIAM J. Optim. 12 (2002), no. 3, 715–723.
- R.A. Hauser and O. Güler. "Self-scaled barrier functions on symmetric cones and their classification". *Found. Comput. Math.* 2 (2002), no. 2, 121–143.
- R.A. Hauser and N. Kirchner. "A Historical Note on the Entropy Principle of Muller and Liu". Contin. Mech. Thermodyn. 14 (2002), no. 2, 223–226.
- ◊ R.A. Hauser and H. Matzinger. "Smallest faithful representation of a C\*–algebra". Proc. Amer. Math. Soc., Vol.123, (1995), no. 11, 3379–3384.

#### **Conference Papers**

- R. Kovacs, O. Gunluk and R.A. Hauser. "Low-Rank Boolean Matrix Approximation by Integer Programming". NIPS 2017, Optimization in Machine Learning Workshop. arXiv:1803.04825 [cs.LG].
- R.A. Hauser and R. Tütüncü. "SDP Approximability of Relative Robust QP", Proc. Appl. Math. Mech. 7, 20600432060044 (2007). PAMM Vol 7, Issue 1.
- N. Gupta, R. Hauser and N. Johnson. "Robust methods for tracking intelligent agents playing in an artificial financial market", AAMAS, May 2007.
- A. Argyriou, R. Hauser, Ch. Micchelli and M. Pontil. "A DC-programming algorithm for kernel selection". Proceedings of ICML 2006. DOI: 10.1145/1143844.1143850.
- N. Gupta, R. Hauser and N. Johnson. "Using Artificial Market Models to Forecast Financial Time-Series". Workshop on Economic Heterogeneous Interacting Agents 2005. Essex, United Kingdom. arXiv:0706.0870 [cs.CE], DOI: 10.1117/12.638334.
- N. Gupta, R. Hauser, N. Johnson. "Deducing the multi-trader population driving a financial market". *Proceedings of SPIE: Complex Systems*, Vol. 6039. The International Society for Optical Engineering. Brisbane, Australia. 2005

#### Patents

- R.A. Hauser, M. Klodt. "A medical imaging system for producing a digital 3-dimensional image from measurements with overlap on a single fixed array of X-ray detectors, emitted from multiple X-ray sources. US patent application 15230501, priority filing August 2016. Publication No WO/2018/029439.
- R.A. Hauser, K. Patel and G. Travish. "Medical imaging system with a fixed array of X-ray detectors and a fixed array of X-ray emitters for producing a digital 3-dimensional image". US Patent application PCT/IB2016/000119, priority filing December 2015. International Application No PCT/IB2016/000637, filing date 25 Jan 2016. Publication No WO/2017/130018, publication date 03 Aug 2017.
- ◊ R.A. Hauser and G. Travish. "A method of designing an x-ray emitter panel". Application PCT/IB2015/057792, priority filing October 16 2014. World wide Patent WO2016059535 A1 granted April 21 2016.
- R.A. Hauser and D. Goodman. "Parallel Processing". UK Patent Application PXM40225P.GBA, priority filing Feb 22 2008, US Patent US20090216996 A1 filed Feb 20 2009. IPC G06F 9/38, G06F 9/02, G06F 15/76. Publication date 27 Aug 2009. Publication No 20090216996.

### Reports

- ◊ M. Troha and R.A. Hauser. "The Existence and Uniqueness of a Power Price Equilibrium". arXiv:1408.2464.
- ◊ T. Schmelzer and R.A. Hauser. "Seven Sins in Portfolio Optimization". arXiv:1310.3396.
- T. Schmelzer, R.A. Hauser, E. Andersen and J. Dahl. "Regression techniques for Portfolio Optimisation using MOSEK". arXiv:1310.3397 [q-fin.PM].
- ◊ R.A. Hauser. "The S-Procedure via Dual Cone Calculus". arXiv:1305.2444 [math.OC].
- R.A. Hauser, V. Krishnamurthy and R. Tütüncü. "Relative Robust Portfolio Optimization". arXiv:1305.0144 [q-fin.PM].
- N. Gupta and R.A. Hauser. "Kalman Filtering with Equality and Inequality State Constraints". arXiv:0709.2791 [math.OC].
- R.A. Hauser. "Target directions for primal-dual interior-point methods for self-scaled conic programming". Winner of the 2000 SIAM Student Paper Prize. www.damtp.cam.ac.uk/user/na/NA\_papers/NA1999\_15.ps.gz

#### Theses

- R.A. Hauser. "On Search Directions for Self-Scaled Conic Programming". Ph.D. thesis. School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY, USA. January 2000.
- ◊ R.A. Hauser. "Smallest Faithful Representations of C\*-Algebras". Master thesis in mathematics, ETH Zurich, 1993.

#### **Outreach Publications**

◊ R. Hauser and M. Pontil. "Converging Disciplines". International Innovation, Issue 140, May 2014, pp. 70-73.

## **Financements Obtained**

- "Distributed Approximate Interior Point Methods for Big Data Problems". Grant TU/B/000038. Turing Fellowship. Alan Turing Institute, London. Awarded Sep 2016.
- "Tomosynthesis in X-Ray Emitter Array Imaging Systems". Grant EP/K503769/1. EPSRC Impact Acceleration Secondment Scheme. Awarded Feb 2016, GBP 104'470.-, to fund a one-year postdoctoral position at the Oxford Mathematical Institute and Adaptix Ltd.
- "Image Recovery in Flat-Screen X-Ray Systems". EPSRC grant EP/H02686X/1, Platform Grant Scheme 5 of the Oxford Mathematical Institute. Awarded November 2013, GBP 22,480.– plus overheads, matched by GBP 48,400.– from Adaptix Ltd. to fund a one-year postdoctoral position at the Oxford Mathematical Institute.
- "Quantitative Investment Management in a Post-Crisis World". DPhil grant BK/13/002 paid for by HSBC, GBP 130,000.–.
- "Order of Fluctuations in Random Media". Grant EP/I01893X/1. Platform Grant Scheme 3 of the Oxford Mathematical Institute. Awarded June 2011, funding two visitors for a period of two months (GBP 5000.-). Complemented by grant SGS/11 from the IMA (GBP 400.- awarded in August 2011).
- Structured Sparsity Methods in Machine Learning and Convex Optimisation". EPSRC grant EP/H02686X/1, responsive mode. Co-PI with Massimiliano Pontil (UCL). Awarded Dec 2009 (Oxford part GBP 154'740.-) for a period of three years.
- "Robust Portfolio Optimisation". EPSRC CASE studentship proposal co-funded by NOMURA as industrial partner. Co-PI with William Shaw (OCIAM). Accepted June 2004. CASE studentship awarded for a period of three years (GBP 48,000.– plus student fees). CASE student: Denis Zuev.
- "Grid Services for Distributed Data Analysis". Studentship project proposal submitted to NERC, March 2003. Co-PI with Myles Allen (Oxford Atmospheric Physics) and Andrew Martin (OUCL). Accepted June 2003. CASE studentship awarded for a period of three years (GBP 48,000.– plus student fees). CASE student: Daniel Goodman.
- "Feasibility Control in nonlinear systems solving". Research proposal submitted to Nuffield Foundation under the award scheme of newly appointed lecturers in science, engineering and mathematics. Principal Investigator. Accepted April 2003. GBP 5000.– awarded.
- "Stiffness in Optimisation". Grant GR/S34472/01. EPSRC grant proposal submitted in responsive mode, September 2002, three year project with 30 month appointment of a postdoctoral research associate. Principal investigator. Accepted March 2003. GBP 120,000.– awarded. Postdoctoral research associate: Coralia Cartis.
- "Newton Directions for Interior-Point Methods in Self-Scaled Conic Programming". Research proposal submitted to the award scheme *Bourses pour Chercheurs Débutants* from the Swiss National Science Foundation and the Swiss Academy of Technical Sciences. Principal Investigator. SFr. 43,000.– awarded August 1998.

## **Selected Recent Presentations**

- Aug 2018. "PCA by Determinant Optimization has no Spurious Local Optima". KDD 2018, London, United Kingdom.
- 2 Jul 2018. "IP models for dimensionality reduction and feature selection in categorical data sets". ISMP 2018, Bordeaux, France.
- ◊ 6 Feb 2018. "Emitter Array Tomosynthesis via Nonlinear Compressed Sensing". KAUST Workshop on Optimization and Big Data, Thuwal, Saudi Arabia. Invited talk.
- ◊ 30 Oct 2017. "Nonlinear Compressed Sensing for Multi-Emitter X-Ray Imaging". EMMCVPR 2017, Venice, Italy.
- ◊ 19 Jul 2017. "Singular Value Decompositions and Optimization of Symmetric Functions". FoCM Barcelona, Spain. Invited talk.
- ◊ 8 Dec 2016, University of Manchester, UK. Department of Mathematics, Inverse Problem Seminar. "X-Ray Tomosynthesis via Nonlinear Compressed Sensing".
- ♦ 10 Aug 2016. "Tomography with nonlinear compressed sensing", ICCOPT 2016, Tokyo, Japan. Invited talk.
- 12 Mar 2016. "Computing the leading part SVD of large dense matrices", Workshop on Advances in OR applied to Finance, Brunel University, London, UK. Invited talk.
- 25 Nov 2015. "Computing the leading part SVD of large dense matrices", ATI Scoping Workshop Distributed Machine Learning and Optimization, ICM Edinburgh, UK. Invited Talk.
- 26 Oct 2015, Mathematical Finance Seminar, School of Mathematics, Georgia Institute of Technology, Atlanta, USA. "Calculation of a power price equilibrium under risk averse trading of futures contracts".
- Sept 2015. "Calculation of a power price equilibrium under risk averse trading of futures contracts". OR 2015, Vienna, Austria.
- ◊ 18 February 2015, Oxford Man Institute Seminar. "Robust Portfolio Optimization".
- 1 May 2014. "Model Building in Quantitative Investment Strategies", Oxford Man Institute Workshop in Quantitative Finance. Oxford, UK. Invited Talk.
- ◊ 9 Oct 2014. "X-ray Imaging with Emitter Panels", Radius Diagnostics Workshop, Harwell, UK. Invited talk.
- 27 Jun 2014. ICMS Workshop Convex Optimization and Beyond, Edinburgh, UK, "The Role of Convex Optimization in Optimal Alignments of Random Sequences". Invited talk.
- ◊ 20 May 2014. OP14, San Diego, USA, "Polynomial Optimization in Biology".
- 18 Feb 2014, Oxford Invariants Society, Oxford, UK. "The Role of Convex Optimization and Large Deviations Theory in the Understanding of Optimal Alignments of Random Sequences".
- 11 Sept 2013. Technical University Munich, Germany. Risk Management Reloaded Conference, "A General Duality Theorem for Pessimal Risk Aggregation". Contributed Talk.
- I9 July 2013. Isaac Newton Institute, Cambridge, UK. Workshop on Positive Polynomials, "Likelihood Maximisation on Phylogenetic Trees". Invited talk.
- ◊ 6–8 June 2013. Ist Portuguese Meeting on Industrial Mathematics, University of Porto, Portugal. "Conic Programming Techniques in Finance". 3h Plenary Talk.
- 8 Feb 2013, Numerical Analysis and Scientific Computing Seminar, Department of Mathematics, University of Manchester, UK. "Distribution of Aligned Letter Pairs in Optimal Alignments of Random Sequences".
- ◊ 21 Jun 2012, Bachelier Finance Society 7th World Congress, 19 22 June 2012, Sydney, Australia. "Quantitative Fund Management under Heavy Tailed Return Distributions.
- 7 Jun 2012, SIAM Student Chapter Conference, University of Edinburgh, UK. "Convex Optimisation in Finance and Quantitative Trading". Invited talk.
- 30 May 2012, Danish OR Society Workshop, Copenhagen, Denmark. "Convex Optimisation in Finance and Quantitative Trading". Plenary talk.
- 26 May 2012, BIRS Workshop on Robust Optimisation, Banff, Canada. "Robust Portfolio Optimisation Under Heavy Tailed Returns". Invited talk.

## Supervision

#### Postdoctoral Research Associates

- ◊ Jaroslav Fowkes. Postdoctoral Research Fellow at the Oxford Emirates Data Laboratory, Sep 2016 present.
- Maria Klodt. Postdoctoal Research Fellow on EPSRC Platform Grant co-funded by Radius Diagnostics Ltd. Jan 2015 – Apr 2017. Joined the Engineering Department of the University of Oxford as a postdoc.
- Martin Lotz. Research Fellow on the DFG Grant "Geometric Methods in the Probabilistic Analysis of Condition Numbers". 14 Months starting from June 2008. Joined the University of Edinburgh as a postdoc, followed by an Assistant Professorship at Manchester University. Now an Associate Professor at Warwick University.
- Coralia Cartis. Postdoctoral research associate on EPSRC funded project "Stiffness in Optimisation". Joined Edinburgh University as a University Lecturer, now an Associate Professor at the University of Oxford.

### Doctoral Students

- ◊ Reka Kovacs, Alan Turing Institute, London, UK, Sep 2018 present. "Unified Framework of Dimensionality Reduction in Data Science".
- Giancarlo Antonucci CDT in Industrially Focussed Mathematical Modelling, Mathematical Institute, Oxford, UK, Sep 2018 – present. "Time Parallel Algorithms for Tokamak Simulation". In collaboration with the Culham Centre for Fusion Energy, Culham, UK.
- ◊ Julien Vaes, Alan Turing Institute, London, UK, Sep 2017 present. "Power network optimization".
- Jonathan Peters, CDT in Industrially Focussed Mathematical Modelling, Mathematical Institute, Oxford, UK, Sep 2017 – present. "Steam Turbine Optimization". In collaboration with Siemens Power Systems, Muelheim an der Ruhr, Germany.
- Joseph Field, CDT in Industrially Focussed Mathematical Modelling, Mathematical Institute, Oxford, UK, Sep 2017 – present. "Compressed sensing reconstruction of dynamic Xray imaging". In collaboration with Adaptix Imaging Ltd, Begbroke, UK.
- Gonçalo Simoes Matos, Mathematical Finance Group, Mathematical Institute, Oxford, UK, 2018. "Robust Portfolio Optimisation with Filtering Uncertainty".
- Sheng Fang, Numerical Analysis Group, Mathematical Institute, Oxford, UK, 2018. "Distributed Computing of Large-Scale Singular Value Decompositions".
- Miha Troha, Numerical Analysis Group, Mathematical Institute, Oxford, UK, 2015. "Fundamental model for dynamics of electricity prices".
- Sergey Shahverdyan, Mathematical Finance Group, Mathematical Institute, Oxford, UK, 2015. "Model Free Optimisation in Risk Management".
- Denis Zuev, Oxford Centre for Industrial and Applied Mathematics, UK, 2009. "Robust Portfolio Optimisation with Structured Uncertainty".
- Nachiketa Gupta, Oxford University Computing Laboratory, UK, 2008. "Constrained Kalman Filtering and Complex Systems".
- Daniel Goodman, Oxford University Computing Laboratory, UK, 2007. "A Service Oriented Architecture and Language for Abstracted Distributed Algorithms". Jointly supervised with Andrew Martin (OUCL).
- Jelena Nedić, Oxford University Computing Laboratory, UK, 2004. "On the Dynamics of Unconstrained Optimisation Methods".

## Doctoral Training Projects

- Giancarlo Antonucci, CDT in Industrially Focussed Mathematical Modelling (InFoMM), Oxford Mathematical Institute, Oxford, UK, Apr–Jun 2018. "Optimisation of the Size of the Time Chunks in Implementing the Parareal Algorithm".
- Jonathan Peters, CDT in Industrially Focussed Mathematical Modelling (InFoMM), Oxford Mathematical Institute, Oxford, UK, Jul–Sep 2017. "Robust vehicle routing". Joint supervision with Jeremy Bradley and George Dikas (Tesco PLC, UK).

- Joseph Field, CDT in Industrially Focussed Mathematical Modelling (InFoMM), Oxford Mathematical Institute, Oxford, UK. Jul–Sep 2017. "Parametric Models for Motion Correction". Joint supervision with Andrew Thompson (Oxford Mathematical Institute), Gil Travish and Paul Betteridge (Adaptix Ltd., UK).
- Alissa Kamilova, CDT in Industrially Focussed Mathematical Modelling (InFoMM), Oxford Mathematical Institute, Oxford, UK, Jul–Sep 2017. "Blade Path Optimization in Steam Turbine Design". Joint supervision with Tobias Ruehle (Siemens AG, Germany).

### MSc Theses

- Julien Bruno, MSc in Mathematical Modelling and Scientific Computing, Oxford Mathematical Institute, UK, May–Sep 2018. "Risk Averse Dynamic Pricing in Revenue Management of Network Carriers." Co-supervised with Jaroslav Fowkes.
- Ningzhi Tang, MSc in Mathematical Modelling and Scientific Computing, Oxford Mathematical Institute, UK, May–Sep 2018. "Medium-Term Forecasting of Airport Passenger Numbers". Co-supervised with Jaroslav Fowkes.
- Reka Kovacs, MSc in Mathematical Modelling and Scientific Computing, Oxford Mathematical Institute, UK, May–Sep 2017. "Integer Programming Models for Boolean Matrix Factorization".
- Ilan Price, MSc in Mathematical Modelling and Scientific Computing, Oxford Mathematical Institute, UK, May– Sep 2017. "Demand Unconstraining in Revenue Management". Co-supervised with Jaroslav Fowkes.
- Alexis Nortier, Part-time MSc in Mathematical Finance. Oxford Mathematical Institute, UK, 2016. "Robust Optimization of Portfolios with Factor Exposure".
- Andraz Erzin, MSc in Mathematical and Computational Finance, Oxford Mathematical Institute, UK, Jun 2015.
   "Applying Machine Learning Techniques to Portfolio Optimization".
- Islam Hassouna, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2014. "Flight Survey Path Optimization". Industrial project sponsored by Arkex Ltd.
- Bruno Rosetto, MSc in Mathematical and Computational Finance, University of Oxford, UK, Apr–Jun 2014.
   "Multi-Period Minimum Entropy Conditional Portfolio Updating and Allocation".
- Fangyuan Cao, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2013. "Optimal Toothbrush Design". Industrial Project sponsored by Philips.
- Kevin Ngan, MSc in Mathematical and Computational Finance, University of Oxford, UK, Apr–Jun 2013. "LCS and Data Cleaning in High Frequency Trading."
- Naveed Ausaf, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2013. "Optimal Sequence Alignment by Distributional Information".
- (Co-Supervisor of) Benjamin Timmerman, MSc in Mathematical Finance, University of Oxford, UK, Dec 2012.
   "Pricing CMS Spread Options under different Copulas".
- Andrew Taylor, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2012. "Dynamic Lap Time Simulation of Circuit Racing Cars". Industrial project sponsored by a Formula 1 team that cannot be named for confidentiality reasons.
- Kishan Patel, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2012. "Imaging with X-Ray Emitter Arrays". Industrial project sponsored by Radius Diagnostics Ltd. Winner of the 2014 Hansjörg Wacker Memorial Prize.
- Kirat Dhillon, MSc in Mathematical Modellling and Scientific Computing, University of Oxford, UK, May–Sep 2012. "Knapsack Problems". Industrial project sponsored by NAG Ltd.
- Ben Wang, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2012.
   "Multi-Objective Optimization".
- Ekta Golchha, MSc in Mathematical and Computational Finance, University of Oxford, UK, Apr–Jun 2012.
   "Portfolio Optimization with Drawdown Constraints".
- Marcello Mezzedimi, MSc in Mathematical Finance, University of Oxford, UK, Jun 2011. "Alpha Return on Portfolios Hedged with Short ETFs".
- ◊ Bo Guan, MSc in Mathematical and Computational Finance, University of Oxford, UK, Apr–Jun 2011. "Parameter Shrinkage in Covariance Estimation".

- Yijun Liu, MSc in Mathematical and Computational Finance, University of Oxford, Apr–Jun 2011. "Optimal Trade Execution".
- Sally Hutchings, Mathematics and Foundations of Computer Science, University of Oxford, UK, May–Sep 2011.
   "The Behaviour of Modularity-Optimizing Community Detection Algorithms".
- Andree Heseler, MSc in Mathematical Finance, University of Oxford, UK, Sep 2011. "Asset Allocation under a Conditional Diversification Measure".
- Nga Hoang, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2010. "Parallel Line Search Methods". Industrial project sponsored by NAG Ltd.
- James Wood, MSc in Mathematical Modelling and Scientific Computing, University of Oxford, UK, May–Sep 2010. "Maximum Likelihood Estimation in Phylogenic Trees".
- Sha Duans, MSc in Mathematical and Computational Finance, University of Oxford, UK, Apr-Jun 2010. "Variable Gearing in Asset Management".
- Samuel Clarke, MSc in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May–Sep 2007. "Robust Staff Level Optimisation in Call Centres".
- Delany Adom, MSc in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May– Sep 2007. "Robust Deviation Optimisation in Portfolio Theory".
- Ivan Weber, MSc in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May– Sep 2005. "Robust Pricing in Revenue Management".
- Kanika Dhyani, MSc in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May–Sep 2004. "Computational Study of a New Polynomial Time Algorithm for Linear Programming".
- Christian Schröder, MSc in Applied and Computational Mathematics, OUCL and OCIAM, Oxford, UK, May–Sep 2004. "Semidefinite Programming Bounds in Bayesian Statistics".
- Quentin Decouvlaere, M.Sc. in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May–Sep 2003. "Upper Bounds for the LCS Problem".
- ◊ Berthold Heymann, part time M.Sc. in Mathematical Finance, OCIAM, Oxford, UK, Sep 2004."Optimisation Approach for Asset Liability Management/Capital Allocation".
- Nadine Gottschalk, part time M.Sc. in Mathematical Finance, OCIAM, Oxford, Sep 2003. "Robust Portfolio Management".
- Roman Pausch, part time M.Sc. in Mathematical Finance, OCIAM, Oxford, UK, Nov 2002. "Shortfall Risk Approach to Managing the Portfolio of a Pension Fund".
- Ka Victoria Mak, M.Sc. in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, UK, May–Sep 2002. "A Heuristic for Portfolio Rebalancing with Transaction Costs".
- Gauthier Lambert, M.Sc. in Mathematical Modelling and Scientific Computing, OUCL and OCIAM, Oxford, May–Sep 2002. "Valuing Gas Storage", industrial project.
- ◊ Juergen Stein, part time M.Sc. in Mathematical Finance, OCIAM, Oxford, UK, Aug 2002. "Portfolio Theory and Market Fluctuation".

#### Undergraduate Theses

- Shen Zhao, Pembroke College, University of Oxford, UK, Jun–Aug 2016. "Principal Component Analysis of Internet Traffic and Web Site Optimization".
- Fabian Ying, Mathematical Institute, University of Oxford, UK, Jun–Aug 2014. "Integrality Constraints in Portfolio Optimisation".
- Marta Kaczan, Part B Dissertation, Mathematical Institute, University of Oxford, UK, Oct 2013 Mar 2014.
   "Portfolio Optimisation".
- Karyn Cooke, Part C Dissertation, Oxford Mathematical Institute, UK, Oct 2012 Mar 2013. "Quadratic Integer Programming and the Cross-Docking Problem".
- ◊ Maulik Pipalia, Part C Dissertation, Oxford Mathematical Institute, UK, Oct 2011 Mar 2012. "Optimal Trade Execution".
- Nicholas Balz, Part C Dissertation, Oxford Mathematical Insitute, UK, Oct 2009 Mar 2010. "Newton's Method and Newton Fractals".

 Chris Lormoor, Part B Dissertation, Oxford University Computing Laboratory, UK, Apr – Jun 2006. "Large Scale Linear Programming".

# Teaching

## Lecturing

- Hilary Term 2019: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. *Numerical Analysis*. 16h lecture course for Part A undergraduates in Mathematics, Maths & Statistics, and Maths & Computer Science.
- Hilary Term 2019: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimisation. 8h lecture course on optimisation theory for MSc in Mathematical and Computational Finance.
- Michaelmas Term 2018: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for Part B undergraduates in Mathematics, Maths & Statistics, and Maths & Computer Science.
- Trinity Term 2018: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Constructive Mathematics. 8h lecture course for Prelims undergraduates in Mathematics.
- Hilary Term 18: ALAN TURING INSTITUTE, London, UK. Delayed Column Generation in Large Scale Integer Optimization Problems. ATI Master Class on Optimisation. 4h lecture course for 1st year PhD students. New course.
- Michaelmas Term 2017: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for Part B undergraduates in Mathematics, Maths & Statistics, and Maths & Computer Science.
- Hilary Term 2017: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimisation Part II. 8h lecture course on optimisation theory for MSc in Mathematical and Computational Finance.
- October 2016: ALAN TURING INSTITUTE OF DATA SCIENCE, London, UK. *Masterclass in Discrete Optimization*.
   4h lecture course for 1st year PhD students. New course.
- Michaelmas Term 2016: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Optimisation Part I. 5h lecture course for MSc in Mathematical Finance and MSc in Computational and Mathematical Finance.
- Michaelmas Term 2016: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for Part B undergraduates in Mathematics, Maths & Statistics, and Maths & Computer Science.
- Hilary Term 2015: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimisation Part II. 8h lecture course on optimisation theory for MSc in Mathematical and Computational Finance. New course.
- Michaelmas Term 2014: DOCTORAL TRAINING CENTRE FOR INDUSTRIALLY FOCUSED MATHEMATICS, Oxford, UK. *Discrete Models*. 6 lectures. New course.
- Michaelmas Term 2014: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Optimisation Part I. 5h lecture course for MSc in Mathematical Finance and MSc in Mathematical and Computational Finance.
- Michaelmas Term 2014: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in mathematics.
- ◊ Trinity Term 2014: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Constructive Mathematics. 8h lecture course for first year mathematicians (Moderations), first course in algorithms.
- Michaelmas Term 2013: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Conic Optimization Models in Finance. 5h lecture course for Part-time M.Sc. in Mathematical Finance.
- Michaelmas Term 2013: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in mathematics.
- Trinity Term 2013: UNIVERSIDADE DO PORTO, Porto, Portugal. Optimization Practice in the Financial Industry.
   Sh Special Topics Course at the Vth Porto Meeting on Mathematics for Industry.
- Hilary Term 2013: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Continuous Optimisation. 16h lecture course for 4th year undergraduates in mathematics.
- ◊ Michaelmas Term 2012: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Conic Optimization Models in Finance. 5h lecture course for Part-time M.Sc. in Mathematical Finance.
- ◊ Michaelmas Term 2012: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in mathematics.
- Trinity Term 2012: NATCOR Course on Convex Optimisation, Brunel University, London, UK. Nesterov's First Order Method for Smooth and Nonsmooth Convex Programming. 2h special topic lecture course for PhD students. New course.

- Hilary Term 2012: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Continuous Optimisation. 16h lecture course for 4th year undergraduates in mathematics.
- Michaelmas Term 2011: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Conic Optimization Models in Finance. 5h lecture course for Part-time M.Sc. in Mathematical Finance.
- Michaelmas Term 2011: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- ◇ Trinity Term 2011: OXFORD MAN INSTITUTE, Oxford, England. Robust Methods in Quantitative Fund Management. 12h lecture course for senior quant researchers at Man AHL, Oxford Man Institute and Man Group London, UK. New course.
- Hilary Term 2011: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Continuous Optimisation. 16h lecture course for 4th year undergraduates in mathematics.
- Michaelmas Term 2010: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- Michaelmas Term 2010: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Optimization in Finance.
   6h lecture course for Part-time M.Sc. in Mathematical Finance.
- ◊ Trinity Term 2010: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimisation Methods in Finance. 12h lecture course for MSc in Mathematical and Computational Finance.
- Michaelmas Term 2009: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- Michaelmas Term 2009: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. Optimization Models in Finance. 6h lecture course for Part-time M.Sc. in Mathematical Finance.
- ◊ Trinity Term 2009: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimization in Finance. 12h lecture course for M.Sc. in Mathematical and Computational Finance.
- Hilary Term 2009: OXFORD COMPUTING LABORATORY, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- Hilary Term 2009: OXFORD UNIVERSITY, Oxford, UK. Taught Course Centre, Mathematical Institute: Lecturing 6h optimisation module of the course Numerical Linear Algebra and Optimization, PhD level course broadcast via the internet to University of Warwick, Imperial College, University of Bristol, and the University of Bath.
- Trinity Term 2008: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Optimization Models in Finance. 12h lecture course for the M.Sc. in Mathematical and Computational Finance.
- Trinity Term 2008: NOMURA CENTRE FOR MATHEMATICAL FINANCE, Oxford, UK. *Optimization in Finance*. 6h lecture course for the part-time M.Sc. in Mathematical Finance (executive programme).
- Hilary Term 2008: OXFORD UNIVERSITY, Oxford, UK. Taught Course Centre, Mathematical Institute: Lecturing 6h optimisation module of the course *Numerical Linear Algebra and Optimization*, PhD level course broadcast via the internet to University of Warwick, Imperial College, University of Bristol, and the University of Bath. New course.
- Michaelmas Term 2007: OXFORD COMPUTING LABORATORY, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- Trinity Term 2007: OXFORD UNIVERSITY, Oxford, UK. Oxford Centre for Industrial and Applied Mathematics (OCIAM): Lecturing *Conic Optimization in Finance* & Workshop on Conic Programming, Part time M.Sc. in Mathematical Finance. New 12h course.
- Trinity Term 2007: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory and OCIAM: Optimization in Finance. 16h special topic course for M.Sc. in Mathematical Modelling and Scientific Computing.
- September 2006: OXFORD UNIVERSITY, Oxford, UK. Oxford Centre for Industrial and Applied Mathematics (OCIAM): *Optimization in Finance*, 6h lecture course for the part time M.Sc. in Mathematical Finance (executive programme).
- Michaelmas Term 2006: OXFORD COMPUTING LABORATORY, Oxford, UK. Integer Programming. 16h lecture course for 3rd year undergraduates in computer science and/or mathematics.
- Trinity Term 2006: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory and OCIAM: Lecturing Optimization in Finance, special topic course for M.Sc. in Mathematical Modelling and Scientific Computing and M.Sc in Applied and Computational Mathematics. New course.

- Michaelmas Term 2005: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory: Lecturing Integer Programming, Part B course for 3rd year undergraduates in computer science and/or mathematics.
- Hilary Term 2005: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory: Lecturing Integer Programming, Part B course for 3rd year undergraduates in computer science and/or mathematics. New course.
- Hilary Term 2005: OXFORD UNIVERSITY, Oxford, UK. Mathematical Institute: Lecturing Continuous Optimization, Section C course for 4th year undergraduates in mathematics.
- Trinity Term 2004: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory: Lecturing Symmetric Cones, advanced special topic course for D.Phil. students in numerical analysis. New course.
- Hilary Term 2004: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory and OCIAM: Lecturing Interior-Point Methods, special topic course for M.Sc. in Mathematical Modelling and Scientific Computing and M.Sc in Applied and Computational Mathematics. New course.
- Hilary Term 2004: OXFORD UNIVERSITY, Oxford, UK. Mathematical Institute: Lecturing Introduction to Continuous Optimisation (Paper c10) for 4th year undergraduates in mathematics.
- Trinity Term 2003: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory: Lecturing *Convex Analysis*, special topic course for D.Phil. students. New course.
- Hilary Term 2003: OXFORD UNIVERSITY, Oxford, UK. Mathematical Institute: Lecturing Introduction to Continuous Optimisation (Paper C10) for students in the Honour School of Mathematics.
- Trinity Term 2002: OXFORD UNIVERSITY, Oxford, UK. Computing Laboratory and OCIAM: Lecturing Nonlinear Optimization, special topic course for M.Sc. in Mathematical Modelling and Scientific Computing and M.Sc in Applied and Computational Mathematics. New course.
- April 2002: SANTA CLARA UNIVERSITY, Santa Clara, Cuba. Dept. Math. and Comp.: Spring-school graduate course in interior-point methods. New course.
- Hilary Term 2002: OXFORD UNIVERSITY, Oxford, UK. Mathematical Institute: Lecturing Introduction to Continuous Optimisation (Paper c10) for 4th year undergraduates in mathematics, 16h. New course.
- ◇ 1991–1993: ABENDTECHNIKUM DER INNERSCHWEIZ, Lucerne, Switzerland. Throughout my undergraduate university studies I earned my living expenses by carrying out a variety of jobs, notably supply teaching of physics at high school level, and by lecturing *Calculus I–IV* and *Linear Algebra I&II* at the Faculty of Mechanical Engineering of ATIS.

## Tutorial Teaching

- October 2007–present: PEMBROKE COLLEGE OXFORD, Oxford, UK (144h of paired tutorials per annum): Probability (Prelims), Probability (Part A), Statistics and Data Analysis (Prelims), Statistics (Part A), Calculus of Variations (Part A), Numerical Analysis (Part A), Dynamics (Prelims), Fourier Series and PDEs (Prelims), Waves and Diffusion (Part A), Differential Equations I (Part A), Differential Equations II (Part A), Multivariable Calculus (Part A), Classical Mechanics (Part A), Optimization (Prelims), Constructive Mathematics (Prelims),
- October 2007 present: OXFORD MATHEMATICAL INSTITUTE, Oxford, UK. Intercollegiate classes in Continous Optimisation (Part C), Integer Programming (Part B).
- October 2001–2007: PEMBROKE COLLEGE OXFORD, Oxford, UK (144h of paired tutorials per annum): Nonphysical applied mathematics, physical applied mathematics, mathematical methods and models, differential and integral equations, probability theory, statistics and linear programming for first and second year students in mathematics, and real analysis of visiting students.
- October 2001–2007: DEPARTMENT OF STATISTICS, UNIVERSITY OF OXFORD, Oxford, UK. Intercollegiate classes in Combinatorial Optimisation (Part C and 1st year doctoral students).
- Lent Term 2000: UNIVERSITY OF CAMBRIDGE, Cambridge, UK. Department of Applied Mathematics and Theoretical Physics. Tutorials in *Numerical Analysis Part II*.
- ◊ 1995–1999: SCHOOL OF OPERATIONS RESEARCH AND INDUSTRIAL ENGINEERING, CORNELL UNIVERSITY, Ithaca, USA. During my doctoral studies I supported myself by teaching tutorials in Game Theory (undergraduate level) and Statistics (1st year PhD level).

# Examining

## **Doctoral Examiner**

- ◊ Jake Walvin, PhD in Mathematics, University of Manchester, UK, Sep 2018.
- Dong Li, "Robust Optimization with Applications in Supply Chain Management". Said Business School Oxford. Spring 2016.
- Maria Bazzi, Mathematical Institute, Oxford, Spring 2015. (Community detection in networks applied to finance.)
- External PhD examiner of Martin Takác, University of Edinburgh, April 2014. (Mathematical optimisation in big data applications.)
- ◊ Jan Witte, Mathematical Institute, Oxford, Jan 2012. (Options pricing.)
- Patrick Hewlett, Mathematical Institute, Oxford, Nov 2011. (Order book mechanics and liquidation problems.)
- ◊ Jaroslav Fowkes, Mathematical Institute, Oxford, June 2011. (Surrogate methods.)
- Xiaodong Luo, Mathematical Institute, Oxford University, November 2009. (Kalman ensemble filtering.)
- Max Jensen, OUCL NA Group, Oxford, February 2005. (Worked on adaptive Galerkin finite element methods for Friedrichs systems.)
- Colin Percival, OUCL PR Group, Oxford, January 2005. (Worked on string matching algorithms and applications in distributing software updates.)
- Lehel Banjai, OUCL NA Group, Oxford, September 2003. (Worked on numerical Schwartz-Christoffel mapping and the spectral method for solving PDEs.)
- ◊ Shawn Rusaw, OUCL PR Group, Oxford, July 2002. (Worked on non-smooth analysis in robotics.)

## DPhil Transfer and Confirmation Examiner

- ◊ Simon Vary, "Multi-Spectral Sparse Sampling". InFoMM CDT, Oxford Mathematical Institute. Sept 2017.
- Lindon Roberts, "Derivative-Free Optimisation Algorithms for Least-Squares Problems". InFoMM CDT, Oxford Mathematical Institute. Sept 2017.
- Bogdan Toader, "Source Reconstruction from Hydrophone Data". InFoMM CDT, Oxford Mathematical Institute. Sept 2017.
- ◊ Fan Wang, University of Oxford, Statistics Department. 2014 & 2015.
- Mohsin Javed, Oxford Mathematical Institute. 2013.
- Dong Li, "Robust Optimization with Applications in Supply Chain Management". Said Business School Oxford. Transfer of Status viva 2013. Confirmation of Status viva Oct 2015.
- ◊ Jan Witte, OCIAM. 2009.
- ◊ Jaroslav Fowkes, OUCL. 2008.
- ◊ Chin-Yun Chang, OUCL Programming Research Group, Oxford, November 2007. (Worked on genetic algorithms for alternative splicing.)
- Patrick Hewlett, Mathematical Finance Group, OCIAM. 2006.
- Christoph Ortner, OUCL NA Group, Oxford, June 2004. (Worked on the numerical simulation of crack propagation in alloys.)
- Sue Dollar, OUCL NA Group, Oxford, November 2003. (Worked on Schilders factorisation based preconditioners for saddle-point problems.)
- ◊ Andris Lasis, OUCL NA Group, Oxford, September 2003. (Worked on adaptive finite-element methods.)

## MSc Examiner

- ◊ Chairman of Examiners of the MSc in Mathematical Modelling and Scientific Computing, 2010–2011.
- Examiner for MSc in Mathematical Modelling and Scientific Computing and for MSc in Applied & Computational Mathematics, OUCL and OCIAM, 2003–2006, and 2008–2011. Includes setting, checking and marking tests, and vivaing 10 students per year on their MSc theses.

#### Undergraduate Examiner

- ◊ External Examiner for the Undergraduate Courses in Mathematics, Oct 2013 Sep 2017, Brunel University, London, England.
- ◊ Part C Examiner, Oct 2016 Sep 2017, University of Oxford, England.
- ◊ Part B Examiner, Oct 2013 Sep 2016, University of Oxford, England.
- Setter and marker of finals problems for *Continuous Optimisation* (Section C, 2002-2005, 2011–2013) and *Integer Programming* (Part B, 2005–2014, 2016-2018), University of Oxford, England.
- ◊ Setter and marker of optimisation exams for the MSc in Mathematical Finance and the MSc in Mathematical and Computational Finance (2007 – 2017).
- ◊ Exam checker of finals questions for various Section C courses since 2002, University of Oxford, England.
- ◊ Setter of Oxford Maths Admissions test 2005, University of Oxford, England.

# Administrative Service

### Service to Professional Bodies

- ◊ Member of the NATCOR Executive Committee, Sept 2014 present.
- ◊ EPSRC Peer Review Panel member.
- ◊ Secretary of FoCM, Aug 2002 2005.
- ◊ Board member of FoCM, Aug 2002 2005.
- ◊ Member of FoCM Council, Aug 2005 2011.

### **Editorial Service**

- ◊ Associate Editor of *SIAM J. Optim.*, January 2005 December 2010.
- Regular referee for SIAM J. Optim., Math. Program., IMA J. Numer. Anal., Found. Comput. Math., Applied Mathematical Finance, SIAM J. Numer. Anal., CUP, Journal of Statistical Physics and various other.
- ◊ Member of the EPSRC Peer Review Panel.

#### Conference and Workshop Organisation

- Co-Organiser of the Alan Turing Institute scoping workshop "Distributed machine learning and optimization", ICMS Edinburgh, 25-27 Nov 2015.
- ◊ 1-Day Workshop on Portfolio Optimization, Oxford Man Institute, March 2014.
- International Symposium on Combinatorial Optimization 2012, Said Business School Oxford, Member of the Organising Committee.
- ◊ Co-organiser of the Conic Optimization stream at ISMP 2012 in Berlin.
- ◊ Co-organiser of continuous optimisation workshop, FoCM 2011, Budapest.
- ◊ Co-organiser of the stream "Conic Optimization" at ISMP 2009 in Chicago.
- Co-organiser of optimisation workshop, FoCM 2008, Hong Kong.
- ◊ Co-organiser of conic optimisation stream, ICCOPT-MOPTA 2007, Hamilton, Ontario.
- ◊ Session organiser at ISMP 2006, Rio de Janeiro.
- ◊ Co-organiser of optimization stream at EURO 2006, Reykjavik.
- Co-organiser of optimization workshop, FoCM 2005, Santander.
- Regular organiser of Optbridge optimization workshops.
- Helper at ICM 94 in Zürich: organised distribution of travel funds to mathematicians from the former Soviet Union; translator for the conference secretary (Russian–German).

#### Service to the University of Oxford

- Oirector of Graduate Studies Teaching (DGS-T), Oxford Mathematical Institute, 2017 2020. (Responsibility for academic and pastoral care of all MSc students and DPhil students at the Oxford Mathematical Institute up to their transfer exams, oversight of all MSc courses and training aspects of doctoral training centres, coordination of graduate training, assist with high-level support for departmental activities, ex-officio member on a number of departmental committees, administration of the broadening requirements for DPhil students, represent the department on various committees of the MPLS Division, chair the Graduate Studies Committee).
- ◊ Executive Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Graduate Admissions and Awards Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- MSc in Mathematical Modelling and Scientific Computing (MMSC) Supervisory Committee (ex officio), Oxford Mathematical Institute, 2017 – 2020.
- MSc in Mathematics and Foundations of Computer Science (MFOCS) Supervisory Committee (ex officio), Oxford Mathematical Institute, 2017 – 2020.
- MSc in Mathematical and Computational Finance (MCF) Supervisory Committee (ex officio), Oxford Mathematical Institute, 2017 2020.

- MSc in Mathematical Finance (MF) Supervisory Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- MSc Oxford Master in Mathematical Sciences (OMMS) Supervisory Committee (ex officio), Oxford Mathematical Institute, 2017 – 2020.
- Centre of Doctoral Training in PDEs Management Committee (ex officio), Oxford Mathematical Institute, 2017 – 2020.
- Centre of Doctoral Trining in Industrially Focussed Mathematical Modelling Steering Committee (ex officio), Oxford Mathematical Institute, 2017 – 2020.
- ◊ Graduate Studies Committee (Chair, ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Consultative Committee for Graduate Students (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Research Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Department Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Nominations Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Nominations of Examiners Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- Selection Committee of Hooke Fellowships, 2018 present.
- ◊ Teaching Awards Committee (ex officio), Oxford Mathematical Institute, 2017 2020.
- ◊ Faculty Committee, Oxford Mathematical Institute, 2009 present.
- ◊ Teaching Committee (ex officio), Oxford Mathematical Institute, 2017 present.
- ◊ Convenor of the Numerical Analysis Group, Oxford Mathematial Institute, 2017 present.
- ◊ MPLS Educational Committee (ex officio), Mathematical Physical and Life Sciences Division, University of Oxford, 2017 2020.
- ◊ MPLS Graduate Studies Committee (ex officio), Mathematical Physical and Life Sciences Division, University of Oxford, 2017 2020.
- ◊ MPLS RTF (ex officio), Mathematical Physical and Life Sciences Division, University of Oxford, 2017 2020.
- ◊ Hiring Committee for an Assistant Professorship in Data Science, Oxford Mathematical Institute 2017.
- Hiring Committee for an Associate Professorship in Operations Research, Said Business School, Oxford 2016/17.
- Hiring Committee for an Associate Professorship in Operations Research, Said Business School, Oxford 2015/16.
- ♦ Hiring Committee for an Associate Professorship in Algebra, Oxford Mathematical Institute 2014/15.
- ♦ Hiring Committee for an Assistant Professorship in Optimization, Oxford Mathematical Institute 2012/13.
- ◊ Supervisory Committee for the MSc in Mathematical and Computational Finance, Sept 2007 2014.
- ◊ Admissions Committee for MSc in Mathematical Modelling and Scientific Computing" and MSc in Applied and Computational Mathematics, OUCL and OCIAM, Oxford, October 2002 – 2005, includes interviewing ca 50 candidates each year.
- ◊ Supervisory Committee of the MSc in Mathematical Modelling and Scientific Computing, and of the MSc in Applied and Computational Mathematics. 2002 2005.
- ◊ IT Fellows Committee, 2001 present.
- ◊ Working Group for a new CS Degree. 2002 2005.
- ◊ Undergraduate Teaching Panel, October 2002 2005.
- ◊ Representing MSc programmes of OUCL and OCIAM at Forum Centrale Paris, November 2004 & 2005.

#### Service to the Alan Turing Institute of Data Science, London

◊ PhD Admissions, 2016 – present.

#### Service to Pembroke College Oxford

- Senior Mathematics Tutor (2001 present). (Director of studies for 35–40 students at any given time, sole responsibility for planning and organising the teaching of mathematics at the College, appointing stipendiary lecturers, planning and conducting the process of admitting undergraduate and graduate students in mathematics to the College (upwards of 50 candidates interviewed each year since 2001), pastoral support of students, writing reference letters for students and staff.)
- ◊ Computing Fellow (June 2002 present).
- ◊ Dean of Pembroke College (2011–2012). (Responsibility for discipline and welfare of 510 students).
- ◊ Deputy Dean (Trinity Term 2002, 2010–2011).
- ◊ Deputy Dean of Degrees (Hilary Term 2008 present).
- ◊ Governing Body (2001 present).
- ◊ Finance and Planning Committee (MT 2014 TT 2018)
- ◊ Investment Committee (MT 2008 TT 2014).
- ◊ Computing Committee (2002 present).
- ◊ Website Steering Group (2004 present).
- ◊ Communications Committee (2013 present).
- ◊ Welfare Committee (2010 2012).
- ◊ Buildings Committee (2011 2012).
- ◊ Domestic Committee (2011 2012).
- ◊ Standing Committee (2009 2010, 2018 present).
- ◊ New Build Steering Committee (Hilary Term 2008 2010).
- ♦ Academic Committee (2001 2008).
- ◊ Hiring Committee for the appointment of the position of Biochemistry Fellow (2003).
- ◊ Hiring Committee for the appointment of the position of Fellow in Law (2004).
- ◊ Hiring Committee for the appointment of the position of Fellow in Pure Mathematics (2015).
- Regularly heading up Hiring Committees for the appointment of Stipendiary Lecturers in Mathematics.
- Participation in fund-raising and alumni-relations events.
- College representative at Technos International Week 2005, a two-week liaisons event at Technos International College, Tokyo.