Ruth Misener

r.misener@imperial.ac.uk

Professor in Computational Optimisation
Department of Computing

Imperial College London
wp.doc.ic.ac.uk/rmisener/

Research Domain: Computational Optimisation

Foundations

Mixed-integer nonlinear optimisation (MINLP), Computational & numerical optimisation, Software implementations for global optimisation, Process systems engineering, Bayesian optimisation

Applications

Decision-making under uncertainty, Process design & operations, Scheduling, Experimental design

Reproducibility & Accessibility

My research team develops and maintains open-source code on GitHub, releases video presentations on YouTube, and announces new research on LinkedIn (link)

Professional Appointments

Imperial College		London, UK
Professor	Department of Computing	2020-
Senior Lecturer	Department of Computing	2017-20
Lecturer	Department of Computing	2014-17
Royal Academy of Eng. Research Fellow	Centre for Process Systems Engineering	2012-14

Education

Princeton University — Princeton, NJ
PhD in Chemical Engineering. Advised by Professor C. A. Floudas. — 2012

Thesis Title: Novel Global Optimization Methods: Theoretical & Computational Studies on Pooling Problems with Environmental Constraints

Massachusetts Institute of Technology — Cambridge, MA
Bachelor of Science in Chemical Engineering — 2007

Awards

Fellowships / Scholarships

BASF / Royal Academy of Engineering Research Chair in Data-Driven Optimisation	2022-27
Engineering & Physical Sciences Research Council Early Career Fellowship	2017-22
Royal Academy of Engineering Research Fellowship	2012-17
Imperial College Junior Research Fellowship *(declined in favour of the RAEng Fellowship)*	2012-15
USA National Science Foundation Graduate Research Fellowship	2007-12
Princeton University Gordon Y. S. Wu Fellowship	2007-12
Robert C. Byrd Honors Scholarship	2003-07

Awards

Mellichamp Lectureship, Purdue University	2024
Roger Needham Award, for *contributions in computer science by a UK-based researcher with up to 10 years post-doc experience*, British Computing Society (BCS)	2023
Best Paper, *Computers & Chemical Engineering* (1 award out of 287 manuscripts, with Folch, Lee, Shafei, Walz, Tsay & van der Wilk)	2023

Saville Lecture, Princeton University	2023
NeurIPS Top Reviewer (among 8% of reviewers with highest quality reviews)	2022, 23
COIN-OR Cup Winner, OMLT judged *best contribution to open-source operations research software development* (with Ceccon, Jalving, Haddad, Thebelt, Tsay & Laird)	2022
Rosenbrock Prize for the best paper in *Optimization & Engineering* (1 award out of 103 manuscripts, with Kronqvist)	2021
Distinguished Paper Award, Conference on the Integration of Constraint Programming, Artificial Intelligence, & Operations Research (CPAIOR, 1 award out of 30 manuscripts, with Kronqvist & Tsay)	2021
CAST Outstanding Young Researcher Award, American Institute of Chemical Engineers	2020
Best (Innovative) Demo, International Conference on Autonomous Agents & Multi-Agent Systems (AAMAS, with Cyras, Karamlou, Lee, Letsios & Toni)	2020
Industrial & Engineering Chemistry Research 2019 Class of Influential Researchers	2019
Suzanne C. and Duncan A. Mellichamp Distinguished Lecture, Georgia Tech	2018
Finalist for *Best Teaching for Postgraduates*, Imperial Student Academic Choice Award	2018
Sir George Macfarlane Medal	2017
RAEng Engineers Trust Young Engineer of the Year	2017
American Institute of Chemical Engineers 35 Under 35, *Innovation* Category	2017
Finalist for *Best Innovation in Teaching*, Imperial Student Academic Choice Award	2016
W. David Smith, Jr. Graduate Student Paper Award	2014
Best Paper, *Journal of Global Optimization* (with Floudas)	2013
Top Reviewer, *Computers & Chemical Engineering*	2013
Best Poster, 2nd Belgian Symposium on Tissue Engineering (39 entries)	2013
Excellence in Teaching, Princeton School of Engineering & Applied Sciences	2010
Member, *MIT Tau Beta Pi - Engineering Honor Society* The top 20% of MIT Engineering Undergraduates are eligible for TBP	2007

Additional Awards to my Team under my Leadership

STEM for Britain, Selected to present research in Parliament	*Zhang*	2025
	Kronqvist	2021
	Mistry	2019
	Olofsson	2019
3rd Poster Prize BioMedEng22	*Sedgwick*	2022
EPSRC David Clarke Postdoctoral Research Fellowship	*Tsay*	2020
Imperial College Research Fellowship	*Tsay*	2020
NewVoice Media Prize for Computing MEng Thesis	*Suraj G*	2019
Runner up, May Hicks Award from the Operational Research Society	*Page*	2019
Newton International Fellowship from the Royal Society	*Kronqvist*	2019
Poster Prizes in Centre for Process Systems Engineering Annual Industrial Consortium Meeting	*Thebelt*	2019
	Wiebe	2019
	Kouyialis	2017
2nd Presentation Prize, PSE@ResearchDayUK	*Wiebe*	2018
1st Poster Prize, UK/IE Annual Meeting of the Society for Industrial & Applied Mathematics (two-way tie, 34 entries)	*Kouyialis*	2018
Prizes in Dept. of Computing Google Poster Competition	*Olofsson*	2018
	Baltean-Lugojan	2016
	Kouyialis	2015
Winton Capital Applied Computing MSc Project Prize	*Wesselhoeft*	2017
1st Poster Prize PSE@ResearchDayUK (19 entries)	*Kouyialis*	2017
2nd Prize Top Presentation at the Dept. of Computing Research Associate Symposium	*Letsios*	2017
IBM PhD Fellowship	*Baltean-Lugojan*	2017

FOCAPO/CPC Travel Grant	*Kouyialis*	2017
Donald Davies Memorial Prize for MEng Thesis	*Mistry*	2015
2^{nd} *Prize* Nobuyuki Idei Young Entrepreneur Award	*Fuentes-Garí*	2013

Peer-Reviewed Journal Papers (Google Scholar)

J63 Sedgwick R., Goertz J. P., Stevens M. M., **Misener R.**, van der Wilk M. Transfer Learning Bayesian Optimization to Design Competitor DNA Molecules for Use in Diagnostic Assays. *Biotechnology & Bioengineering*, **122**:189210, 2025.

J62 Zhang S., Campos J. S., Feldmann C., Sandfort F., Mathea M., **Misener R.** Augmenting optimization-based molecular design with graph neural networks. *Computers & Chemical Engineering*, 186:108684, 2024. **Invited for a special issue dedicated to ESCAPE 33**, GitHub link

J61 Zhang S., Lee R. M., Shafei B., Walz D., **Misener R.**, Dependence in constrained Bayesian optimization: When do we need it and how does it help?, *Optimization Letters*, **18**:1457-1473, 2024. GitHub link

J60 **Misener R.**, Biegler L. Formulating data-driven surrogate models for process optimization. *Computers & Chemical Engineering*, 179:108411, 2023.
Invited for a special issue associated with FOCAPO/CPC 2023

J59 Addis B., Castel C., Macali A., **Misener R.**, Piccialli V., Data augmentation driven by optimization for membrane separation process synthesis, *Computers & Chemical Engineering*, 108342, 2023.

J58 Odgers J., Kappatou C. D., **Misener R.**, García-Muñoz S., Filippi S. Probabilistic predictions for partial least squares using bootstrap. *AIChE Journal*, 2023. GitHub link

J57 Kappatou C. D., Odgers J., García-Muñoz S., **Misener R.** An Optimization Approach Coupling Preprocessing with Model Regression for Enhanced Chemometrics. *Industrial & Engineering Chemistry Research*, **62**:6196-6213, 2023. GitHub link

J56 Folch J. P., Lee R. M., Shafei B., Walz D., Tsay C., van der Wilk M., **Misener R.** Combining Multi-Fidelity Modelling and Asynchronous Batch Bayesian Optimization. *Computers & Chemical Engineering*, 2023. **Awarded Best Paper (1 out of 287 manuscripts)**, Video link, GitHub link

J55 Campos J. S., Parpas P., **Misener R.** Partial Lasserre relaxation for sparse Max-Cut. *Optimization & Engineering*, 2023. Video link, GitHub link

J54 Ceccon F.*, Jalving J.*, Haddad J., Thebelt A., Tsay C., Laird C. D.†, **Misener R.**† OMLT: Optimization & Machine Learning Toolkit. *Journal of Machine Learning Research*, **23**:349, 2022.
* Authors contributed equally. † Authors contributed equally. Video link, GitHub link

J53 Thebelt A., Wiebe J., Kronqvist J., Tsay C., Misener R., Maximizing information from chemical engineering data sets: Applications to machine learning. *Chemical Engineering Science*, **252**:117469, 2022.
Invited for a special issue on *Digitalisation*

J52 Ceccon F., **Misener R.** Solving the pooling problem at scale with extensible solver GALINI. *Computers & Chemical Engineering*, **159**:107660, 2022. GitHub link

J51 Wiebe J., Cecílio I., Dunlop J., **Misener R.** A robust approach to warped Gaussian process-constrained optimization. *Mathematical Programming*, 2022. Video link, GitHub link

J50 Thebelt A., Tsay C., Lee R. M., Sudermann-Merx N., Walz D., Tranter T., **Misener R.** Multi-objective constrained optimization for energy applications via tree ensembles. *Applied Energy*, **306**: 118061, 2022. **Invited for a special issue on *Artificial Intelligence for Smart Energy Systems in Process Industries***, Video link, GitHub link

J49 Wiebe J., **Misener R.** ROmodel: modeling robust optimization problems in Pyomo. *Optimization & Engineering*, **23**: 1873-1894, 2022.
Video link, GitHub link **Invited for *Robust Optimization* special issue**

J48 Mistry M., Letsios D., Lee R. M., Krennich G., **Misener R.** Mixed-Integer Convex Nonlinear Optimization with Gradient-Boosted Trees Embedded. *INFORMS Journal on Computing*, **33**: 1103-1119, 2021. GitHub link

J47 Thebelt A., Kronqvist J., Mistry M., Lee R. M., Sudermann-Merx N., **Misener R.** ENTMOOT: A Framework for Optimization over Ensemble Tree Models. *Computers & Chemical Engineering*, **151**:107343, 2021. Video link, GitHub link

J46 Pistikopoulos E. N., Barbosa-Povoa A., Lee J. H., **Misener R.**, Mitsos A., Reklaitis G. V., Venkatasubramanian V., You F., Gani R. Process Systems Engineering – The Generation Next? *Computers & Chemical Engineering*, **147**:107252, 2021.

J45 Letsios D., Bradley J. T., Suraj G, **Misener R.**, Page N. Approximate and robust bounded job start scheduling for Royal Mail delivery offices. *Journal of Scheduling*, **24**:237-258, 2021.

J44 Letsios D., Mistry M., **Misener R.** Exact Lexicographic Scheduling & Approximate Rescheduling, *European Journal of Operational Research*, **290**:469-478, 2021. GitHub link

J43 Kronqvist J., **Misener R.** A disjunctive cut strengthening technique for convex MINLP, *Optimization & Engineering*, **22**: 1315-1354, 2021. GitHub link, **Invited for a special issue on *MINLP, dedicated to Marco Duran*, awarded *Rosenbrock Prize* as best paper out of 103 published in 2021**

J42 Ceccon F., Siirola J. D., **Misener R.** SUSPECT: MINLP Special Structure Detector for Pyomo, *Optimization Letters*, **14**: 801-814, 2020. GitHub link
Invited article for a special issue in memory of Professor C. A. Floudas

J41 Letsios D., Baltean-Lugojan R., Ceccon F., Mistry M., Wiebe J., **Misener R.** Approximation Algorithms for Process Systems Engineering. *Computers & Chemical Engineering*, **132**: 106599, 2020.
Invited for a special issue celebrating the *Life & Work of Prof. R.W.H. Sargent*

J40 Kouyialis G., Wang X., **Misener R.** Symmetry Detection for Quadratic Optimization Using Binary Layered Graphs. *Processes*, **7**: 11, 2019.
Invited for the special issue to *Celebrate the Life & Work of Prof. R.W.H. Sargent*

J39 Wiebe J., Cecílio I., **Misener R.** Robust optimization for the pooling problem. *Industrial & Engineering Chemistry Research*, **58**:12712-12722, 2019.
Invited for a special issue titled *I&EC Research 2019 Class of Influential Researchers*

J38 Furini F., Traversi E., Belotti P., Frangioni A., Gleixner A., Gould N., Liberti L., Lodi A., **Misener R.**, Mittelmann H., others, QPLIB: A Library of Quadratic Programming Instances, *Mathematical Programming Computation*, **11**:237265, 2019.

J37 Campos J. S., **Misener R.**, Parpas P. A multilevel analysis of the Lasserre hierarchy, *European Journal of Operational Research*, **277**:32-41, 2019.

J36 Olofsson S., Hebing L., Niedenführ S., Deisenroth M. P., **Misener R.** GPdoemd: a Python package for design of experiments for model discrimination, *Computers & Chemical Engineering*, **125**:54-70, 2019. **Invited article for a special issue dedicated to PSE 2018**, GitHub link

J35 Olofsson S., Mehrian M., Calandra R., Geris L., Deisenroth M. P., **Misener R.** Bayesian Multi-Objective Optimisation with Mixed Analytical and Black-Box Functions: Application to Tissue Engineering, *IEEE Transactions on Biomedical Engineering*, **66**:727 - 739, 2019.

J34 Wiebe J., Cecílio I., **Misener R.** Data-driven optimization of processes with degrading equipment, *Industrial & Engineering Chemistry Research*, **57**:17177 - 17191, 2018. GitHub link

J33 **Misener R.**, Allenby M. C., Fuentes-Garí M., Gupta K., Wiggins T., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Stem Cell Biomanufacturing under Uncertainty: A Case Study in Optimizing Red Blood Cell Production, *AIChE Journal*, **64**:3011 - 3022, 2018.
The editors invited *future chemical engineering leaders* to contribute research for *Futures Series*. Of the 25 researchers appearing in the founding issue, I was 1 of 6 invited to present at a special session in the 2018 AIChE meeting (weblink).

J32 Baltean-Lugojan R., **Misener R.**, Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness, *Journal of Global Optimization*, **71**:655 - 690, 2018. **Invited article for a special issue in memory of Professor C. A. Floudas**, GitHub link

J31 Mistry M., Callia D'Iddio A., Huth M., **Misener R.** Satisfiability Modulo Theories for Process Systems Engineering, *Computers & Chemical Engineering*, **113**:98 - 114, 2018.
Invited article for a special issue dedicated to FOCAPO/CPC 2017

J30 Letsios D., Kouyialis G., **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches Problem in Heat Recovery Network Design, *Computers & Chemical Engineering*, **113**:57 - 85, 2018. **Invited for a special issue in memory of Professor C. A. Floudas**, GitHub link

J29 Mehrian M., Guyot Y., Papantoniou I., Olofsson S., Sonnaert M., **Misener R.**, Geris L. Maximizing Neotissue Growth Kinetics in a Perfusion Bioreactor: An *In Silico* Strategy Using Model Reduction and Bayesian Optimization, *Biotechnology & Bioengineering*, **115**:617 - 629, 2018.

J28 Allenby M. C., **Misener R.**, Panoskaltsis N., Mantalaris A. A quantitative three-dimensional (3D) image analysis tool for maximal acquisition of spatial heterogeneity data. *Tissue Engineering Part C: Methods*; **23**:108 - 117, 2017.

J27 Savvopoulos S. V., **Misener R.**, Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. A Personalized Framework for Dynamic Modeling of Disease Trajectories in Chronic Lymphocytic Leukemia. *IEEE Transactions on Biomedical Engineering*; **63**:2396 - 2404, 2016.

J26 Ceccon F., Kouyialis G., **Misener R.** Using Functional Programming to recognize Named Structure in an Optimization Problem: Application to Pooling. *AIChE Journal*; **62**:3085 - 3095, 2016. GitHub
Invited article for *Tribute to Founders: Roger Sargent. Process Systems Engineering*

J25 Mistry M., **Misener R.** Optimising Heat Exchanger Network Synthesis using Convexity Properties of the Logarithmic Mean Temperature Difference. *Computers & Chemical Engineering*; **94**:1 - 17, 2016. GitHub link

J24 Boukouvala F., **Misener R.**, Floudas C. A. Global Optimization Advances in Mixed-Integer Nonlinear Programming, MINLP, and Constrained Derivative-Free Optimization, CDFO. *European Journal of Operational Research*; **252**:701 - 727, 2016.

J23 Fuentes-Garí M., **Misener R.**, Georgiadis M. C., Kostoglou M., Pistikopoulos E. N., Panoskaltsis N., Mantalaris A. Selecting a differential equation cell cycle model for simulating leukemia treatment; *Industrial & Engineering Chemistry Research*; **54**:8847 - 8859, 2015.

J22 Velliou E., Brito dos Santos S., Papathanasiou M. M., Fuentes-Garí M., **Misener R.**, Panoskaltsis N., Mantalaris A., Pistikopoulos E. N. Towards unravelling the kinetics of an Acute Myeloid Leukaemia model system under oxidative and starvation stress: A comparison between two and three dimensional cultures; *Bioprocess & Biosystems Engineering*; **38**:1589 - 1600, 2015.

J21 Fuentes-Garí M., Velliou E., **Misener R.**, Pefani E., Rende M., Panoskaltsis N., Mantalaris A., Pistikopoulos E. N. A systematic framework for the design, simulation and optimization of personalized healthcare: Making and healing blood; *Computers & Chemical Engineering*; **81**:80 - 93, 2015.

J20 Fuentes-Garí M., **Misener R.**, García-Münzer D., Velliou E., Georgiadis M. C., Kostoglou M., Pistikopoulos E. N., Panoskaltsis N., Mantalaris A. A mathematical model of sub-population kinetics for the deconvolution of leukaemia heterogeneity. *Journal of The Royal Society Interface*; **12**(108), 2015.

J19 **Misener R.**, Smadbeck J. B., Floudas C. A. Dynamically-generated cutting planes for mixed-integer quadratically-constrained quadratic programs and their incorporation into GloMIQO 2; *Optimization Methods & Software*; **30**:215 - 249, 2015.

J18 Velliou E., Brito dos Santos S., Fuentes-Garí M., **Misener R.**, Pefani E., Panoskaltsis N., Mantalaris A., Pistikopoulos E. N. Key environmental stress biomarker candidates for the optimisation of chemotherapy treatment of leukaemia; *Malta Journal of Health Sciences*; **1**:29 - 34, 2014.

J17 **Misener R.**, Fuentes-Garí M., Rende M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Global Superstructure Optimisation of Red Blood Cell Production in a Parallelised Hollow Fibre Bioreactor, *Computers & Chemical Engineering*; **71**:532 - 553, 2014.

J16 **Misener R.**, Floudas C. A. ANTIGONE: Algorithms for coNTinuous / Integer Global Optimization of Nonlinear Equations, *Journal of Global Optimization*; **59**:503 - 526, 2014.

J15 **Misener R.**, Floudas C. A. A framework for globally optimizing mixed-integer signomial programs. *Journal of Optimization Theory & Applications*; **161**:905 - 932, 2014.

J14 **Misener R.**, Floudas C. A. GloMIQO: Global Mixed-Integer Quadratic Optimizer. *Journal of Global Optimization*; **57**:3 - 50, 2013. ***Journal of Global Optimization*** **Best Paper of 2013**
W. David Smith, Jr. Graduate Student Paper Award, 2014

J13 **Misener R.**, Floudas C. A. Global Optimization of Mixed-Integer Models with Quadratic and Signomial Functions: A Review. *Applied Computational Math.*; **11**:317 - 336, 2012.

J12 Skjäl A., Westerlund T., **Misener R.**, Floudas C. A. A Generalization of the Classical αBB Convex Underestimation via Diagonal and Non-Diagonal Quadratic Terms. *Journal of Optimization Theory & Applications*; **154**:462 - 490, 2012.

J11 **Misener R.**, Floudas C. A. Global Optimization of Mixed-Integer Quadratically Constrained Quadratic Programs (MIQCQP) through Piecewise-Linear and Edge-Concave Relaxations. *Mathematical Programming, Series B*; **136**:155 - 182, 2012.
W. David Smith, Jr. Graduate Student Paper Award, 2014

J10 Li J., **Misener R.**, Floudas C. A. Scheduling of Crude Oil Operations under Demand Uncertainty: A Robust Optimization Framework with Global Optimization. *AIChE Journal*; **58**:2373 - 2396, 2012.

J09 Baliban R. C., Elia J. A., **Misener R.**, Floudas C. A. Global optimization of a MINLP process synthesis model for thermochemical based conversion of hybrid coal, biomass, and natural gas to liquid fuels. *Computers & Chemical Engineering*; **42**: 64 - 86; 2012.

J08 Li J., **Misener R.**, Floudas C. A. Continuous-Time Modeling and Global Optimization Approach for Scheduling of Crude Oil Operations. *AIChE Journal* **58**: 205 - 226; 2012.

J07 **Misener R.**, Thompson J. P., Floudas C. A. APOGEE: Global Optimization of Standard, Generalized, and Extended Pooling Problems via Linear and Logarithmic Partitioning Schemes. *Computers & Chemical Engineering* **35**: 876 - 892; 2011.

J06 **Misener R.**, Gounaris C. E., Floudas C. A. Mathematical Modeling and Global Optimization of Large-Scale Extended Pooling Problems with the (EPA) Complex Emissions Constraints. *Computers & Chemical Engineering* **34**: 1432 - 1456; 2010.

J05 **Misener R.**, Floudas C. A. Global Optimization of Large-Scale Generalized Pooling Problems: Quadratically Constrained MINLP Models. *Industrial & Engineering Chemistry Research* **49**: 5424 - 5438; 2010.

J04 **Misener R.**, Floudas C. A. Piecewise-Linear Approximations of Multidimensional Functions. *Journal of Optimization Theory & Applications* **145**: 120 - 147; 2010.

J03 **Misener R.**, Floudas C. A. Advances for the Pooling Problem: Modeling, Global Optimization, & Computational Studies. *Applied & Computational Math.* **8**: 3 - 22; 2009.

J02 **Misener R.**, Gounaris C. E., Floudas C. A. Global Optimization of Gas Lifting Operations: A Comparative Study of Piecewise Linear Formulations. *Industrial & Engineering Chemistry Research* **48**: 6098 - 6104; 2009.

J01 Gounaris C. E., **Misener R.**, Floudas C. A. Computational Comparison of Piecewise-Linear Relaxations for Pooling Problems. *Industrial & Engineering Chemistry Research* **48**: 5742 - 5766; 2009.

Computer Science Conference Proceedings

C13 Odgers J., Sedgwick R., Kappatou C., **Misener R.**, Filippi S. Weighted-Sum Gaussian Process Latent Variable Models *Proceedings of the 28th International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2025. CORE A, *Acceptance Rate = 31.3%*

C12 Folch J. P., Tsay C., Lee R. M., Shafei B., Ormaniec W., Krause A., van der Wilk M., **Misener R.**, Mutný, M. Transition constrained Bayesian optimization via Markov decision processes. *Proceedings of the 38th Conference on Neural Information Processing Systems (NeurIPS)*, 2024. CORE A*, *Acceptance Rate = 25.8%*, GitHub link

C11 Hojny C.*, Zhang S.*, Campos J. S., **Misener R**. Verifying message-passing neural networks via topology-based bounds tightening. *Proceedings of the 41st International Conference on Machine Learning (ICML)*, 2024. * Authors contributed equally. CORE A*, *Acceptance Rate = 27%*, GitHub link

C10 Zhang S., Campos J. S., Feldmann C., Walz D., Sandfort F., Mathea M., Tsay C., **Misener R.** Optimizing over trained GNNs via symmetry breaking. *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS)*, 2023. CORE A*, *Acceptance Rate = 26%*, Video link, GitHub link

C09 Thebelt A., Tsay C., Lee R. M., Sudermann-Merx N., Walz D., Shafei B., **Misener R.** Tree ensemble kernels for Bayesian optimization with known constraints over mixed-feature spaces. *Proceedings of the 36th Conference on Neural Information Processing Systems (NeurIPS)*, 2022. CORE A*, *Acceptance Rate = 26%*, Video link, GitHub link

C08 Folch J. P., Zhang S., Lee R. M., Shafei B., Walz D., Tsay C., van der Wilk M., **Misener R.** SnAKe: Bayesian Optimization with Pathwise Exploration. *Proceedings of the 36th Conference on Neural Information Processing Systems (NeurIPS)*, 2022. CORE A*, *Acceptance Rate = 26%*, Video link, GitHub link

C07 Tsay C., Kronqvist J., Thebelt A., **Misener R.** Partition-Based Formulations for Mixed-Integer Optimization of Trained ReLU Neural Networks. *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS)*, 2021. CORE A*, *Acceptance Rate = 26%*, Video link, GitHub link

C06 Kronqvist J., **Misener R.**, Tsay C. Between steps: Intermediate relaxations between big-M and convex hull formulations. *Proceedings of the International Conference on Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2021. CORE B *Acceptance Rate = 40%*, Video link, **Distinguished Paper Award** (1 award for 30 accepted papers)

C05 Cyras K., Karamlou A., Lee M., Letsios D., **Misener R.**, Toni F. AI-assisted Schedule Explainer for Nurse Rostering. *Proceedings of the 19th International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)*, 2020. CORE A*, *Demo Track*, **Best (Innovative) Demo**, link

C04 Botoeva E., Kronqvist J., Kouvaros P., Lomuscio A., **Misener R.** Efficient Verification of ReLU-based Neural Networks via Dependency Analysis. *Proceedings of the 34th AAAI Conference on Artificial Intelligence (AAAI)*, 2020. CORE A*, *Acceptance Rate = 21%.*

C03 Bradley J. T., Letsios D., **Misener R.**, Page N. Approximating Bounded Job Start Scheduling with Application in Royal Mail Deliveries under Uncertainty. *Proceedings of the 13*th *Conference on Combinatorial Optimization & Applications (COCOA)*, 2019. CORE B, *Acceptance Rate ≈ 50%.*

C02 Cyras K., Letsios D., **Misener R.**, Toni F. Argumentation for Explainable Scheduling. *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*, 2019. CORE A*, *Acceptance Rate = 16%. We were given an oral presentation.*

C01 Olofsson S., Deisenroth M. P., **Misener R.** Design of Experiments for Model Discrimination Hybridising Analytical and Data-Driven Approaches. *Proceedings of the 35th International Conference on Machine Learning (ICML)*, PMLR **80**:3905 - 3914, 2018. CORE A*, *Acceptance Rate = 25%. We were given a **long, 20 min** presentation*

Engineering Conference Proceedings

E27 **Misener R.**, Biegler L. Formulating data-driven surrogate models for process optimization. *Foundations of Computer Aided Process Operations/Chemical Process Control, FOCAPO/CPC*. Tucson, AZ; 2023.

E26 Wiebe J., Misener R. ROmodel: A Python Robust Optimization Modeling Toolbox. In Türkay & Gani (Eds), Proceedings of the 31st European Symposium on Computer Aided Process Engineering. Vol. 50 of *Computer-Aided Chemical Engineering*. Istanbul, TR; 2021, pp 683 - 688.

E25 Thebelt A., Kronqvist J., Lee R. M., Sudermann-Merx N., **Misener R.** Global optimization with ensemble machine learning models. In Pierucci et al. (Eds), Proceedings of the 30th European Symposium on Computer Aided Process Engineering. Vol. 48 of *Computer-Aided Chemical Engineering*. Milan, IT; 2020, pp 1981 - 1986.

E24 Wiebe J., Cecílio I., **Misener R.** The robust pooling problem. In Kiss et al. (Eds), Proceedings of the 29th European Symposium on Computer Aided Process Engineering. Vol. 46 of *Computer-Aided Chemical Engineering*. Eindhoven, NL; 2019, pp 907 - 912.

E23 Olofsson S., Deisenroth M. P., **Misener R.** Optimal Design of Experiments for Model Discrimination using Gaussian Process Surrogate Models. In Eden et al. (Eds), Proceedings of the 13th International Symposium on Process Systems Engineering. Vol. 44 of *Computer-Aided Chemical Engineering*. San Diego, CA; 2018, pp 847 - 852.

E22 Wesselhoeft C., Ham D., **Misener R.** Algorithms for Mixed-Integer Optimization Constrained by Partial Differential Equations. In Eden et al. (Eds), Proceedings of the 13th International Symposium on Process Systems Engineering. Vol. 44 of *Computer-Aided Chemical Engineering*. San Diego, CA; 2018, pp 799 - 804. GitHub link

E21 Olofsson S., Mehrian M., Geris L., Calandra R., Deisenroth M. P., **Misener R.** Bayesian Multi-Objective Optimisation of Neotissue Growth in a Perfusion Bioreactor Set-Up. In Espuña et al. (Eds), Proceedings of the European Symposium on Computer Aided Process Engineering. Vol. 39 of *Computer-Aided Chemical Engineering*. Barcelona, ES; 2017, pp 2155 - 2160.

E20 Mistry M., **Misener R.** Integrating Mixed-Integer Optimisation & Satisfiability Modulo Theories: Application to Scheduling. In Maravelias et al. (Eds), Foundations of Computer Aided Process Operations/Chemical Process Control, FOCAPO/CPC. Tucson, AZ; 2017.
Invited article for the *Young Investigator* Session

E19 Kouyialis G., **Misener R.** Detecting Symmetry in Designing Heat Exchanger Networks. In Maravelias et al. (Eds), Foundations of Computer Aided Process Operations/Chemical Process Control, FOCAPO/CPC. Tucson, AZ; 2017.

E18 Allenby M. C., Tahlawi A., **Misener R.**, Brito dos Santos S., Mantalaris A., Panoskaltsis N. Spatiotemporal Mapping of Erythroid, Stromal, and Osteogenic Niche Formation to Support Physiologic Red Cell Production in a 3-Dimensional Hollow Fibre Perfusion Bioreactor. *Blood*, **128**; 2016; p 3885.

E17 Ulmasov D., Baroukh C., Chachuat B., Deisenroth M. P., **Misener R.** Bayesian Optimisation with Dimension Scheduling Algorithm: Application to Biological Systems. In Kravanja, Bogataj (Eds), 26th European Symposium on Computer Aided Process Engineering. Vol. 38 of *Computer-Aided Chemical Engineering*. Portorož, SI; 2016; pp 1051 - 1056.

E16 Fuentes-Garí M., Zemenides S., **Misener R.**, Georgiadis M. C., Pistikopoulos E. N., Mantalaris A., Panoskaltsis N. Use of Mathematical Modelling Indicates That Patients Treated for Acute Myeloid Leukaemia (AML) Are Undertreated When Ideal Body Weight Is Used to Dose Chemotherapy. *Blood*, **126**; 2015; p 4522.

E15 Allenby M. C., Tahlawi A., Brito Dos Santos S., Hwang Y. S., **Misener R.**, Panoskaltsis N., Mantalaris A. Development of an ex vivo bone marrow mimicry microenvironment in a novel 3D hollow fibre bioreactor. *Experimental Hematology*; **43**; 2015; p S51.

E14 Fuentes-Garí M., **Misener R.**, Georgiadis M. C., Kostoglou M., Pistikopoulos E. N., Panoskaltsis N., Mantalaris A. Chemotherapy Optimization in Leukemia: Selecting the Right Mathematical Models for the Right Biological Processes. 9^{th} IFAC Symposium on Biological & Medical Systems. Vol. 48 of *IFAC-PapersOnLine*. Berlin, DE; 2015; pp 534 - 539.

E13 Allenby M. C., Tahlawi A., Brito Dos Santos S., **Misener R.**, Hwang Y., Panoskaltsis N., Mantalaris A. Development of a hematopoietic microenvironment for the production of red blood cells (RBCs) in a novel 3D hollow fibre bioreactor. *Tissue Engineering Part A*. 21, 2015; pp S15 - S16.

E12 Savvopoulos S. V., **Misener R.**, Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Global Sensitivity Analysis for a Dynamic Model of Chronic Lymphocytic Leukemia Disease Trajectories. In Gernaey et al. (Eds), 12^{th} International Symposium on Process Systems Engineering. Vol. 37 of *Computer-Aided Chemical Engineering*. Copenhagen, DK; 2015; pp 185 - 190.

E11 Fuentes-Garí M., **Misener R.**, Pefani E., García-Münzer D., Kostoglou M., Georgiadis M. C., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Cell cycle model selection for leukemia and its impact in chemotherapy outcomes. In Gernaey et al. (Eds), 12^{th} International Symposium on Process Systems Engineering. Vol. 37 of *Computer-Aided Chemical Engineering*. Copenhagen, DK; 2015; pp 2159 - 2164

E10 **Misener R.**, Allenby M. C., Fuentes-Garí M., Rende M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Optimisation under uncertainty for a bioreactor that produces red blood cells. *J. Tissue Eng. Regen. Med.*; 8; 2014; p 481.

E09 Fuentes-Garí M., **Misener R.**, García-Münzer D., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Development and experimental validation of cyclin-based population balance model of the cell cycle in leukaemia cell lines. *J. Tissue Eng. Regen. Med.*; 8; 2014; p 489.

E08 Velliou E., Brito Dos Santos S., Fuentes-Garí M., **Misener R.**, Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Evolution of an AML model system under oxidative and starvation stress: A comparison between two and three dimensional cultures. *J. Tissue Eng. Regen. Med.*; 8; 2014; p 483.

E07 Velliou E., Fuentes-Garí M., **Misener R.**, Pefani E., Rende M., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. A framework for the design, modeling and optimization of biomedical systems. In Eden et al. (Ed.), *Foundations of Computer-Aided Process Design*. Vol. 34 of *Computer-Aided Chemical Engineering*. Cle Elum, WA; 2014; pp 225 - 236.

E06 **Misener R.**, Chin J., Lai M., Fuentes-Garí M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Robust Superstructure Optimisation of a Bioreactor that Produces Red Blood Cells. In Klemeš, Varbanov, Liew (Ed.), *24*$^{\text{th}}$ *European Symposium on Computer Aided Process Engineering*. Vol. 33 of *Computer-Aided Chemical Engineering*. Budapest, Hungary; 2014; pp 91 - 96.

E05 Skjäl A., Westerlund T., **Misener R.**, Floudas C. A. A Generalization of Classical αBB Underestimation to Include Bilinear Terms. In Bogle, Fairweather (Ed.), *22*$^{\text{nd}}$ *European Symposium on Computer Aided Process Engineering*. Vol. 30 of *Computer-Aided Chemical Engineering*. London, UK; 2012; pp 1202 - 1206.

E04 **Misener R.**, Floudas C. A. Global Optimization of Large-Scale Extended and Generalized Pooling Problems: Mixed-Integer Nonlinearly Constrained Models. *Global Optimization Workshop*, Toulouse, FR; 2010; pp 89 - 92.

E03 **Misener R.**, Gounaris C. E., Floudas C. A. Global Optimization and Parametric Analysis of Large-Scale Extended Pooling Problems. In Pierucci, Ferraris (Ed.), *20*$^{\text{th}}$ *European Symposium on Computer Aided Process Engineering*. Vol. 28 of *Computer-Aided Chemical Engineering*. Naples, IT; 2010; pp 847 - 852.

E02 **Misener R.**, Gounaris C. E., Floudas C. A. Advances In Global Optimization for Standard, Generalized, and Extended Pooling Problems with the (EPA) Complex Emissions Model Constraints. *Foundations of Computer-Aided Process Design*. Breckenridge, CO; 2009; pp 1053 - 1073.

E01 **Misener R.**, Gounaris C. E., Floudas C. A. Multidimensional Piecewise-Affine Approximations for Gas Lifting and Pooling Applications. *Foundations of Computer-Aided Process Design*. Breckenridge, CO; 2009; pp 887 - 896.

Computer Science Workshop Papers

W04 Xie Y., Zhang S., Qing J., **Misener R.**, Tsay C. Molecular design using graph Bayesian optimization with shortest-path kernels. *ICLR GEM Workshop*, 2025.

W03 Folch J. P., Odgers J., Zhang S., Lee R. M., Shafei B., Walz D., Tsay C., van der Wilk M., **Misener R.** Practical Path-based Bayesian Optimization. *NeurIPS 2023 Workshop on Adaptive Experimental Design and Active Learning in the Real World (RealML-2023)*, 2023.

W02 Stoddart C., Shrack L., Sserunjogi R., Abdul-Ganiy U., Bainomugisha E., Okure D., **Misener R.**, Folch J. P., Sedgwick R. Gaussian Processes for Monitoring Air-Quality in Kampala. *NeurIPS 2023 Workshop on Tackling Climate Change with Machine Learning: Blending New and Existing Knowledge Systems*, 2023.

W01 Sedgwick R., Goertz J., **Misener R.**, Stevens M, van der Wilk M. Design of Experiments for Verifying Biomolecular Networks. *Machine Learning for Molecules NeurIPS Workshop*, 2020. Video link

Numerical Software & Mathematical Models

The following implementations are primarily written by me. Implementations of my group's optimisation algorithms, i.e. code primarily written by my team, are on our GitHub account.

Numerical Software

S03 **Misener R.**, Floudas C. A. ANTIGONE: Algorithms for coNTinuous / Integer Global Optimization of Nonlinear Equations; 2013. *Commercial through Princeton & GAMS Development Corp.*

S02 **Misener R.**, Floudas C. A. GloMIQO: Global Mixed-Integer Quadratic Optimizer; 2012. *Commercial through Princeton & GAMS Development Corp.*

S01 **Misener R.**, Thompson J. P., Floudas C. A. Algorithms for Pooling-problem global Optimization in GEneralized and Extended classes (APOGEE); 2010. *Freely available tool*

Mathematical Models

M02 **Misener R.**, Floudas C. A. Generalized Pooling Problem. Available from CyberInfrastructure for MINLP; 2011.

M01 **Misener R.**, Gounaris C. E., Floudas C. A. Extended Pooling Problem with the Summer Time (EPA) Complex Emissions Constraints. Available from CyberInfrastructure for MINLP; 2010.

Press & Publications Written for a General Audience

Press about my Research & Teaching

P9 *Machine learning models to support chemical R&D recognised with Best Paper Award.* Imperial News, 2024.

P8 *Professor Ruth Misener Honoured with 2023 BCS Roger Needham Award.* Imperial News, 2023.

P7 *Major contribution by Imperial undergraduate to open-source research software.* Imperial News, 2022.

P6 *Machine learning techniques from Imperial & BASF advance experimental design.* Imperial News, 2022.

P5 *Treasury Minister visits Imperial for launch of apprenticeship programmes.* Imperial News, 2022.

P4 *Imperial & BASF in major partnership to advance future of chemical production.* Imperial News, 2022.

P3 *Imperial scoops three new Royal Academy of Engineering research chairs.* Imperial News, 2022.

P2 *Schlumberger Collaboration.* Imperial News (link), Schlumberger Careers News (link), 2021.

P1 *Decision making under uncertainty.* Imperial Long Read (link), Online event hosted by Imperial Business Partners (YouTube), Imperial News (link), 2021.

Written by Ruth

G5 **Misener R.** Imperial researchers publish 17 papers at NeurIPS 2022 conference. Imperial News, 2022.

G4 **Misener R.** Department of Computing MSc student honoured for her joint work with Royal Mail. Imperial News, 2019.

G3 **Misener R.** Department of Computing researchers selected to present research in Parliament. Imperial News, 2019.

G2 **Misener R.** Christodoulos Achilleus Floudas. SIAG/OPT Views and News. **24**(1): 12 - 16, 2016.

G1 **Misener R.** Deterministic Global Optimisation at CPSE: Models, Algorithms, and Software. Centre for Process Systems Engineering Newsletter, Issue 10, 2014.

Keynote / Plenary Presentations

Upcoming

K27 **Misener R.** Bayesian optimization for mixed feature spaces using tree kernels and graph kernels. *International Conference on Operations Research (OR 2025).* Semi-Plenary. Bielefeld, DE, 09/2025.

K26 **Misener R.** Bayesian optimization for mixed feature spaces using tree kernels and graph kernels. *International Conference on Continuous Optimization (ICCOPT 2025).* Semi-Plenary. Los Angeles, USA, 07/2025.

K25 **Misener R.** Bayesian optimization for mixed feature spaces using tree kernels and graph kernels. *22nd Conference on Advances in Continuous Optimization (EUROPT 2025).* Plenary. Southampton, UK, 06/2025.

Past

K24 **Misener R.** Bayesian optimization for mixed feature spaces using tree kernels and graph kernels. *9th AIROYoung Workshop.* Plenary. Pavia, IT, 02/2025.

K23 **Misener R.** Optimal decision-making problems with trained surrogate models embedded. *Learning and Intelligent OptimizatioN Conference (LION 18).* Plenary. Ischia Island, IT, 06/2024.

K22 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. *The Alan Turing Institute Workshop on Bayesian Optimisation with Multiple Objectives: Open Challenges for Machine Learning and Optimisation.* Keynote. University of Warwick, 02/2023.

K21 Biegler L., **Misener R.** Integration of Data-Driven Techniques in Mathematical Optimization. *Foundations of Computer Aided Process Operations / Chemical Process Control (FOCAPO/CPC).* Joint keynote. San Antonio, TX, 01/2023.

K20 **Misener R.** Between formulations or: How I Learned to Stop Worrying and Love Parameters. *Workshop on Global Optimization (HUGO).* Plenary. Szeged, HU, 09/2022.

K19 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. *Hong Kong Tech Forum on Grand Challenges in Data Science and Artificial Intelligence.* Virtual invited talk, 07/2022.

K18 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. *Process Systems Engineering (PSE 2021+).* Keynote. Kyoto, JP, 06/2022.

K17 **Misener R.** Computational Mixed-Integer Nonlinear Optimization, *31st European Conference on Operational Research (EURO 2021).* Semi-plenary. Athens, GR, 07/2021.

K16 **Misener R.** Numerical approaches to mixed-integer nonlinear optimization, *7th IFAC Symposium on Nonlinear Model Predictive Control (NMPC 2021).* Plenary. Bratislava, SK, 07/2021. Video link

K15 Thebelt A., Kronqvist J., Mistry M., Lee R. M., Sudermann-Merx N., **Misener R.** ENTMOOT: A Framework for Optimization over Ensemble Tree Models. *Virtual AIChE Annual Meeting*, Computer & Systems Technology Division (10e) Plenary. 11/2020. Video link

K14 **Misener R.** Mixing analytical and data-driven optimization: Application to the process industries, *30th European Symposium on Computer Aided Process Engineering (ESCAPE 2020)*. Online Plenary. 09/2020.

K13 **Misener R.** Developing spatial branch & bound solvers, *Oberwolfach MINLP Workshop*. Opening Plenary. Oberwolfach, DE, 06/2019.

K12 **Misener R.** Mixed-integer nonlinear optimisation for energy efficiency, *1st International Young Professionals Conference on Process Engineering (YCOPE)*. Plenary. Max Planck Institute, Magdeburg, DE, 03/2019.

K11 **Misener R.** Gaussian Processes for Hybridizing Analytical & Data-Driven Decision-Making, *AIChE Annual Meeting*. Presentation as a part of AIChE's 110 Year Celebration. Pittsburgh, USA; 10/2018.

K10 **Misener R.** The pooling problem with a view towards gas transport, *Conference on the Mathematics of Gas Transport*. Plenary. Berlin, DE; 10/2018.

K09 **Misener R.**, Mitsos A. Process Systems Engineering Optimization: Mixed-Integer Nonlinear Programming & Beyond, *Process Systems Engineering (PSE-2018)*. Joint keynote. San Diego, CA, 07/2018.

K08 **Misener R.** Optimisation for energy efficiency, *Department of Computing Research Associate Symposium*. Keynote. Imperial, 06/2018.

K07 **Misener R.** Approximation Algorithms for Process Systems Engineering, *28th European Symposium on Computer Aided Process Engineering (ESCAPE 2018)*. Keynote. Graz, AT, 06/2018.

K06 **Misener R.** Online generation via offline selection of strong linear cuts from QP SDP relaxation, *15th International Conference on Computational Management Science (CMS 2018)*. Semi-plenary. Trondheim, NO, 05/2018.

K05 **Misener R.** Online generation via offline selection of strong linear cuts from QP SDP relaxation, *SCIP Workshop*. Plenary. Aachen, DE, 03/2018.

K04 **Misener R.** Optimisation under Uncertainty: Engineering & Life, *Royal Academy of Engineering Fellows' Day*. Keynote. London, UK, 02/2018.

K03 **Misener R.** Optimisation for Gradient Boosted Trees with Risk Control, *Annual Meeting of the Society for Industrial & Applied Mathematics (SIAM), UK & Republic of Ireland Section (UKIE)*. Plenary. Southampton, UK, 01/2018.
Sponsored by the Institute of Mathematics & its Applications (IMA)

K02 **Misener R.** Designing Energy-Efficient Heat Recovery Networks using Mixed-Integer Nonlinear Optimisation, *16th International Symposium on Experimental Algorithms*. Plenary. London, UK, 06/2017.

K01 **Misener R.** Making and Healing Blood: An Engineer's Approach, *Royal Academy of Engineering Research Forum*. Keynote. London, UK, 09/2013.

Invited Seminars

S51 **Misener R.** Bayesian optimization for mixed feature spaces using tree kernels and graph kernels. Department of Mathematics, University of Edinburgh; 03/2025.

S50 **Misener R.** Autonomous research machines: Self-optimising new chemistry. AI Fun with ELLIS Seminar Series, Manchester Centre for AI Fundamentals, University of Manchester; 01/2025.

S49 **Misener R.** Verifying message-passing neural networks via topology-based bounds tightening. EURO Online Seminar Series on OR and Machine Learning; Virtual, 10/2024.

S48 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. Purdue University Mellichamp Lecture; 10/2024.

S47 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. Instituto Superior Técnico Lisboa, American Corner Seminar; 05/2024.

S46 **Misener R.** Bayesian optimization & design of experiments. Society of Chemical Industry Public Lecture (Virtual); 03/2024.

S45 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. ExxonMobil Modeling, Optimization, & Data Science Technical Community Meeting Seminar (Virtual); 09/2023.

S44 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. Dow Data Science Seminar (Virtual); 05/2023.

S43 **Misener R.** Just Relax. Imperial College London Inaugural Lecture; 03/2023. Video link

S42 **Misener R.** Between formulations or: How I Learned to Stop Worrying and Love Parameters. Cornell Learning Machines Seminar; 02/2023.

S41 **Misener R.** Between formulations or: How I Learned to Stop Worrying and Love Parameters. Princeton University Operations Research & Financial Engineering Seminar; 02/2023.

S40 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. Princeton University Saville Lecture; 02/2023.

S39 **Misener R.** Bayesian optimization & design of experiments, University of Greenwich Leslie Comrie Seminar; 11/2022.

S38 **Misener R.** Scheduling & rescheduling with application to Royal Mail delivery, Research Science Amazon Transportation Services (Virtual); 10/2022.

S37 **Misener R.** Bayesian optimization & design of experiments, PREMIERE Webinar Series; 10/2022.

S36 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. Process, Material, & System Modeling Technical Section Meeting, Aspen Technology, Inc.; 10/2022.

S35 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. Process, Material, & System Modeling Technical Section Meeting, P&G; 04/2022.

S34 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. Operations Research & Financial Engineering, Princeton University; 03/2022.

S33 **Misener R.** Between formulations or: How I Learned to Stop Worrying and Love Parameters. Operations Research Centre, MIT; 03/2022.
Joint with Campos, Ceccon, Haddad, Jalving, Kronqvist, Laird, Parpas, Thebelt, Tsay

S32 **Misener R.** Artificial intelligence approaches towards hybridizing analytical & data-driven decision-making. Department of Chemical Engineering, UT Austin; 09/2021.
Joint work with the Computational Optimisation Group

S31 **Misener R.** Artificial intelligence approaches towards hybridizing analytical & data-driven decision-making. Department of Chemical Engineering, UC Berkeley ; 08/2021.
Joint work with the Computational Optimisation Group

S30 **Misener R.** Partition-based formulations for mixed-integer optimization of trained ReLU neural networks. Mathematics, Physics and Machine Learning Seminar Series, Instituto Superior Técnico; Invited by Prof J Mourão; 06/2021. *Joint work with C Tsay, J Kronqvist, A Thebelt*, Video link

S29 **Misener R.** Partition-based formulations for mixed-integer optimization of trained ReLU neural networks. Machine Learning NeEDS Mathematical Optimization Online Seminar Series; Invited by Prof D Romero; 04/2021. *Joint work with C Tsay, J Kronqvist, A Thebelt*, Video link

S28 **Misener R.** Partial Lasserre relaxation for sparse Max-Cut. Discrete Optimization Talks; Invited by Profs A Kazachkov & E Khalil; 04/2021. *Joint work with JS Campos, P Parpas*, Video link

S27 **Misener R.** Approximation algorithms for process systems engineering. Enterprise-wide Optimization Seminar Series, Center for Advanced Process Decision-making, Carnegie Mellon University; Invited by Prof C Gounaris; 03/2021. *Joint work with the Computational Optimisation Group*

S26 **Misener R.** Scoring positive semidefinite cutting planes for quadratic optimization via trained neural networks. School of Mathematics, Cardiff University; Invited by Dr T Oertel; 12/2019. *Joint work with R Baltean-Lugojan, P Bonami, A Tramontani*

S25 **Misener R.** Artificial intelligence approaches towards hybridizing analytical & data-driven decision-making. Institute for Chemical and Bioengineering, ETH Zürich; Invited by Prof P Arosio; 11/2019. *Joint work with the Computational Optimisation Group*

S24 **Misener R.** Artificial intelligence approaches towards hybridizing analytical & data-driven decision-making. Department of Chemical Engineering, McMaster University, Hamilton, Ontario; Invited by Prof K Khan; 10/2019. *Joint work with the Computational Optimisation Group*

S23 **Misener R.** Scoring positive semidefinite cutting planes for quadratic optimization via trained neural networks. Department of Mathematics and Statistics, McGill University, Montréal; Invited by Prof H Darmon; 10/2019. *Joint work with R Baltean-Lugojan, P Bonami, A Tramontani*

S22 **Misener R.** Scheduling and rescheduling: Explainability, methods, and industrial applications. Centre de Recherches Mathématiques, Polytechnique Montréal, Montréal; Invited by Prof A Lodi & Prof B Shepherd; 10/2019. *Joint work with JT Bradley, K Cyras, D Letsios, N Page, F Toni*

S21 **Misener R.** Approximation algorithms for process systems engineering. Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh; Invited by Prof L Biegler; 03/2019. *Joint work with D Letsios, G Kouyialis*

S20 **Misener R.** Online generation via offline selection: Low dimensional linear cuts from QP SDP relaxation. Department of Industrial and Systems Engineering, University of Wisconsin, Madison; Invited by Prof J Linderoth; 12/2018. *Joint work with R Baltean-Lugojan, P Bonami, A Tramontani*

S19 **Misener R.** Gaussian Processes for Hybridizing Analytical & Data-Driven Decision-Making. Department of Chemical Engineering, University of Wisconsin, Madison; Invited by Prof V Zavala; 12/2018. *Joint work with S Olofsson, J Wiebe, I Cecílio, MP Deisenroth*

S18 **Misener R.** Gaussian Processes for Hybridizing Analytical & Data-Driven Decision-Making. School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta; 09/2018. *Joint with Olofsson, Wiebe, Cecílio, Deisenroth*, **Mellichamp Distinguished Lecture**

S17 **Misener R.** Learning-based Cutting Plane Approximation of Quadratic Programming Convex (SDP) Relaxations. Institute of Information Engineering, Automation & Mathematics, Slovak University of Technology, Bratislava; Invited by Prof R Paulen; 09/2018. *Joint work with R Baltean-Lugojan, P Bonami, A Tramontani*

S16 **Misener R.** Lexicographic Optimisation for Rescheduling. LIX, Laboratoire d'Informatique de l'École Polytechnique; Invited by Dr C D'Ambrosio; 07/2018. *Joint work with D Letsios*

S15 **Misener R.** Optimisation for Gradient Boosted Trees with Risk Control. Department of Chemical Engineering, RWTH Aachen, DE; Invited by Prof A Mitsos; 03/2018. *Joint work with M Mistry, D Letsios, RM Lee, G Krennich*

S14 **Misener R.** Optimisation for Gradient Boosted Trees with Risk Control. Mathematical Institute, University of Oxford, UK; Invited by Prof C Cartis; 02/2018. *Joint work with M Mistry, D Letsios, RM Lee, G Krennich*

S13 **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. School of Chemical Engineering & Analytical Science, University of Manchester, UK; Invited by Dr J Li; 02/2018. *Joint work with D Letsios, G Kouyialis*

S12 **Misener R.** Lexicographic Optimization for Rescheduling. Department of Econometrics & Operations Research, Tilburg University, NL; Invited by Prof E de Klerk; 12/2017. *Joint work with D Letsios*

S11 **Misener R.** Lexicographic Optimization for Rescheduling. Royal Mail Data Science Group, UK; Invited by Dr J Bradley; 12/2017. *Joint work with D Letsios*

S10 **Misener R.** Mixed-Integer Nonlinear Optimisation: Energy Efficiency Applications. School of Mathematics, University of Birmingham, UK; Invited by Prof M Kočvara; 11/2016. *Joint work with R Baltean-Lugojan, F Ceccon, M Mistry*

S09 **Misener R.** Mixed-Integer Nonlinear Optimisation: Energy Efficiency Applications. Department of Chemical Engineering, University of Surrey, UK; Invited by Dr E Velliou; 10/2016. *Joint work with R Baltean-Lugojan, F Ceccon, M Mistry*

S08 **Misener R.** Implementing algorithmic advances in mixed-integer nonlinear optimisation. Department of Mathematics, London School of Economics, UK; Invited by Prof G Zambelli; 01/2016.

S07 **Misener R.** Mixed-Integer Nonlinear Optimisation: Energy Efficiency Applications. School of Mathematics, University of Edinburgh, UK; Invited by Dr A Grothey & Prof K McKinnon; 10/2015. *Joint work with F Ceccon, M Mistry*

S06 **Misener R.** Stem Cell Bioprocessing under Uncertainty: A Case Study in Optimising Red Blood Cell Production. Centre for Computational Engineering Science, RWTH Aachen, DE; Invited by Prof A Mitsos; 02/2015. *Joint work with the Biological Systems Engineering Laboratory*

S05 **Misener R.** Global Optimisation for Process Optimisation. Process Systems Enterprise; London, UK; Invited by Dr P Kleniati; 01/2015.

S04 **Misener R.** Relating MINLP Model Formulations to Algorithmic Solution Strategies. Department of Electronics, Computer Sciences & Systems, University of Bologna, IT; Invited by Prof A Lodi; 06/2014.

S03 **Misener R.** Mixed-Integer Nonlinear Optimization: Foundations and Applications. Department of Computing, Imperial, UK; *Job Talk*; 03/2014.

S02 **Misener R.** Making and Healing Blood: An Engineer's Approach. Department of Chemical Engineering, University of Surrey, UK; Invited by Prof K Kirkby; 01/2014. *Joint work with the Biological Systems Engineering Laboratory*

S01 **Misener R.** Novel Global Optimization Methods: Theoretical & Computational Studies on Pooling Problems with Environmental Constraints. Centre for Process Systems Engineering, Imperial, UK; Invited by Prof E Pistikopoulos; 07/2011. *Joint work with CA Floudas*

International Schools

Sc7 **Misener R.** Transition-constrained Bayesian optimisation [1 hr lecture]. *Sargent Centre Summer School on Bayesian Optimisation*, Imperial, UK; Dr E A del Río Chanona; 09/2024.

Sc6 **Misener R.** Global Optimisation [3 hr lecture]. *Centre for Process Systems Engineering Advanced Optimisation Course*, Imperial, UK; Invited by Prof C Adjiman; 05/2017.

Sc5 **Misener R.** Mixed-Integer Nonlinear Optimisation [2 hr lecture $\times$ 10 days]. *Visiting Professor, Vienna Graduate School On Computational Optimization*, Vienna, AT; Invited by Prof G Pflug; 05/2017.

Sc4 **Misener R.** Introduction to Global Optimisation [2 hr lecture]. *Centre for Process Systems Engineering Introduction to Optimisation Course*, Imperial, UK; Invited by Prof C Adjiman; 04/2017.

Sc3 **Misener R.** Introduction to Global Optimisation [2 hr lecture]. *Centre for Process Systems Engineering Introduction to Optimisation Course*, Imperial, UK; Invited by Prof C Adjiman; 05/2016.

Sc2 **Misener R.** Mixed-Integer Nonlinear Optimisation with Nonconvex Nonlinearities [3 hr lecture]. *MINO/ COST Spring School on Mixed Integer Nonlinear Programming and Applications*, Paris, FR; Invited by Dr C D'Ambrosio; 04/2016.

Sc1 **Misener R.** Global Optimisation [2 hr lecture]. *Centre for Process Systems Engineering Advanced Optimisation Course*, Imperial, UK; Invited by Prof C Adjiman; 04/2015.

Invited Conference & Workshop Presentations [*presenter]

I54 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. *AIchemy Inaugural Annual Conference*; London, UK, 03/2025.

I53 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. *Leverhulme Research Centre for Functional Materials Design Symposium*; Liverpool, UK, 11/2024.

I52 **Misener R.** Optimal decision-making with trained NN embedded. *Computational Optimization at Work*; Berlin, DE, 09/2024.

I51 **Misener R.** Optimizing over trained graph neural networks. *25th International Symposium on Mathematical Programming*; Montréal, CA, 07/2024.

I50 **Misener R.** Optimal decision-making with trained neural networks embedded. *London Operations Research Day*; London, UK, 04/2024.

I49 **Misener R.** OMLT: Optimization & Machine Learning Toolkit. *STOR-i Annual Conference*; Lancaster, UK, 01/2024.

I48 **Misener R.** OMLT: Optimization and Machine Learning Toolkit. *Applied Math Symposium at Bosch*; Renningen, DE; 10/2023.

I47 **Misener R.** Modeling for Optimisation over Trained Graph Neural Networks. *INFORMS Annual Meeting*; Pheonix, AZ, 10/2023.

I46 **Misener R.** Optimization for ML and ML for optimization. Overview talk at the *Institut Mittag-Leffler Workshop: Learning from Both Sides Linear and Nonlinear Mixed-Integer Optimization*; Djursholm, Sweden, 07/2023.

I45 **Misener R.** Partial least squares: Balancing accuracy with robustness. *Sargent Centre Symposium on Model-Based Design of Experiments*; London, UK, 06/2023.

I44 **Misener R.** Professor Floudas' continuing legacy: Automatically designing microreactor experiments. Invited talk at a special session in honor of Professor Floudas at the *33$^{\text{rd}}$ European Symposium on Computer-Aided Process Engineering*; Athens, Greece, 06/2023.

I43 **Misener R.** How I Learned to Stop Worrying and Love Parameters. *4th IMA and OR Society Conference on Mathematics of Operational Research*; Birmingham, UK, 04/2023.

I42 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. *Isaac Newton Institute for Mathematical Sciences Workshop on Computational Challenges and Emerging Tools for Data-Driven Engineering*; Cambridge, UK, 04/2023.

I41 **Misener R.** Machine learning for mathematical optimization and mathematical optimization for machine learning. Tutorial talk at the *Dagstuhl Seminar on Data-Driven Combinatorial Optimization*; Dagstuhl, DE, 10/2022. *Joint work with the Computational Optimisation Group*

I40 **Misener R.** Autonomous research machines: Self-optimizing new chemistry. *ICML Workshop on Adaptive Experimental Design and Active Learning in the Real World*; Baltimore, MD, 07/2022. *Joint work with the Computational Optimisation Group*

I39 Ceccon F., Jalving J., Haddad J., Thebelt A., Tsay C., Laird C. D., **Misener R.*** OMLT: Optimization & Machine Learning Toolkit. *32nd European Conference on Operational Research (EURO)*; Espoo, FI, 07/2022.

I38 Ceccon F., Jalving J., Haddad J., Thebelt A., Tsay C., Laird C. D., **Misener R.*** OMLT: Optimization & Machine Learning Toolkit. *Workshop on Data & Dynamics*; Surrey, UK, 05/2022.

I37 Folch J. P., Lee R. M., Shafei B., Walz D., Tsay C., van der Wilk M., **Misener R.*** Design of flow chemistry experiments using batch Bayesian optimization. *International Online Workshop on Continuous Particle Synthesis and Product Design*; 10/2021.

I36 Tsay C.*, Kronqvist J., Thebelt A., **Misener R.** Partition-based formulations for mixed-integer optimization of trained ReLU neural networks. *INFORMS Annual Meeting*; Anaheim, USA, 10/2021.

I35 Kronqvist J.*, Tsay C., **Misener R.** A Hierarchy of Relaxations between Big-M and Convex Hull Formulations. *INFORMS Annual Meeting*; Anaheim, USA, 10/2021.

I34 Ceccon F., **Misener R.*** Solving the Pooling Problem at Scale with Extensible Quadratic Optimizer GALINI. *INFORMS Annual Meeting*; Anaheim, USA, 10/2021.

I33 Thebelt A.*, Kronqvist J., Mistry M., Lee R. M., Sudermann-Merx N., **Misener R.** Uncertainty Measures and Hierarchical Acquisition Functions for Tree-based Black-Box Optimization. *INFORMS Annual Meeting*; Anaheim, USA, 10/2021.

I32 Thebelt A.*, Kronqvist J., Mistry M., Lee R. M., Sudermann-Merx N., **Misener R.** ENTMOOT: A Framework for Optimization over Ensemble Tree Models. *International Conference on Operations Research (OR2021)*; Bern, CH, 09/2021.

I31 Ceccon F., **Misener R.** GALINI: An Extensible MIQCQP Solver. *Virtual INFORMS Annual Meeting*. 11/2020. Video link

I30 Thebelt A., Kronqvist J., Mistry M., Lee R. M., Sudermann-Merx N., **Misener R.** A Framework for Optimization Over Ensemble Tree Models. *Virtual INFORMS Annual Meeting*. 11/2020. Video link

I29 Kronqvist J., **Misener R.** A Disjunctive Cut Strengthening Technique for MINLP. *Virtual INFORMS Annual Meeting*. 11/2020. Video link

I28 Wiebe J., **Misener R.** A Robust Approach to Warped Gaussian Process-constrained Optimization. *Virtual INFORMS Annual Meeting*. 11/2020. Video link

I27 Mistry M., Thebelt A., Letsios D., Kronqvist J. Lee R. M., Krennich G., **Misener R.** Mixed-Integer Convex Nonlinear Optimization with Gradient-Boosted Trees Embedded. *CRM/DIMACS Workshop on Mixed-Integer Nonlinear Programming*, Montréal, CA; Invited by Prof A Lodi; 10/2019.

I26 Letsios D., Page N., Bradley J., **Misener R.** Bounded job start scheduling under uncertainty: Application to Royal Mail delivery scheduling. *The Operational Research Society Annual Conference (OR61)*. Kent, UK; 09/2019.

I25 Letsios D., Kouyialis G., **Misener R.** Approximation algorithms for process systems engineering. 9^{th} *Foundations of Computer-Aided Process Design*; Copper Mountain, CO, USA; 07/2019.

I24 Baltean-Lugojan R., Bonami P., **Misener R.**, Tramontani A. Selecting cutting planes for quadratic semidefinite outer-approximation via trained neural networks. 23^{rd} *Combinatorial Optimization Workshop*; CNRS Centre Paul Langevin, Aussois, FR; 01/2019.

I23 **Misener R.** Stem Cell Biomanufacturing under Uncertainty: A Case Study in Optimizing Red Blood Cell Production, *AIChE Annual Meeting*. Presentation as a part of AIChE's Futures Series. Pittsburgh, USA; 10/2018. *Joint work with the Biological Systems Engineering Laboratory*

I22 Baltean-Lugojan R., **Misener R.***, Bonami P., Tramontani A. Online generation via offline selection of strong linear cuts from QP SDP relaxation. *Operations Research*, Brussels, BE; Invited by Dr T Berthold; 09/2018.

I21 Ceccon F., **Misener R.** SUSPECT: MINLP Special Structure Detector for Python. *Optimization software, EURO*, Valencia, ES; Invited by Dr T Berthold; 07/2018.

I20 Baltean-Lugojan R.*, **Misener R.**, Bonami P., Tramontani A. Online generation via offline selection: Low dimensional linear cuts from QP SDP relaxation. *International Symposium on Mathematical Programming*, Bordeaux, FR; Invited by Prof C Cartis; 07/2018.

I19 Mistry M.*, Letsios D., **Misener R.**, Krennrich G., Lee R. M. Optimization with Gradient-Boosted Trees and Risk Control. *International Symposium on Mathematical Programming*, Bordeaux, FR; Invited by Prof H Mittelmann; 07/2018.

I18 Letsios D.*, **Misener R.** On Exact Lexicographic Optimization Methods and Approximate Recovery Strategies in Two-Stage Robust Makespan Scheduling. *Computational Integer Programming, International Symposium on Mathematical Programming*, Bordeaux, FR; Invited by Prof D Salvagnin; 07/2018.

I17 Letsios D.*, Kouyialis G., **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. *6^{th} IMA Conference on Numerical Linear Algebra and Optimization*, Birmingham, UK; Invited by Prof C Cartis; 06/2018.

I16 Kouyialis G., Letsios D., **Misener R.*** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. *Multiscale Systems Engineering I: In Honor of Prof C A Floudas, AIChE Annual Meeting*, Minneapolis, USA; Invited by Prof E N Pistikopoulos; 10/2017.

I15 Baltean-Lugojan R., **Misener R.*** Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness. *Foundations of Computational Mathematics*, Barcelona, ES; Invited by Prof C Cartis & Prof E de Klerk; 07/2017.

I14 Baltean-Lugojan R., **Misener R.*** Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness. *15^{th} EUROPT Workshop on Advances in Continuous Optimization*, Montréal, CA; Invited by Prof M Anjos; 07/2017.

I13 Baltean-Lugojan R., **Misener R.*** Globally Optimising Pooling Problems. *Chris Floudas Memorial Symposium*, Princeton, NJ; Invited by Prof F Boukouvala & Prof C Gounaris; 05/2017.

I12 Mistry M., **Misener R.*** Integrating Mixed-Integer Optimization and Satisfiability Modulo Theories: Application to Planning and Scheduling. *Foundations of Computer Aided Process Operations*, Tucson, Arizona; Invited by Prof C Maravelias & Dr J Wassick; 01/2017.

I11 Baltean-Lugojan R.*, **Misener R.** A Parametric Approach to the Pooling Problem. *5^{th} International Conference on Continuous Optimization*, Tokyo, JP; 08/2016.

I10 Ceccon F., **Misener R.*** Using Functional Programming to recognize Named Structure in an Optimization Problem: Application to Pooling. *5^{th} International Conference on Continuous Optimization*, Tokyo, JP; Invited by Prof V Zavala; 08/2016.

I09 Ceccon F., **Misener R.*** Using Functional Programming to recognize Named Structure in an Optimization Problem: Application to Pooling. *28^{th} European Conference on Operational Research*, Poznan, PL; Invited by Dr T Berthold; 07/2016.

I08 Baltean-Lugojan R., **Misener R.*** A Parametric Approach to the Pooling Problem. *Mixed Integer Programming Workshop*, Miami, USA; 05/2016.

I07 Ceccon F., **Misener R.***. Detecting Pooling Network Structure. *Short Research Announcement at the Oberwolfach MINLP Workshop*, Oberwolfach, DE; 10/2015.

I06 **Misener R.***, Mistry M. Solving MINLP with Heat Exchangers: Special Structure Detection and Large-Scale Global Optimisation. *22^{nd} International Symposium on Mathematical Programming*, Pittsburgh, PA; Invited by Prof C Floudas; 07/2015.

I05 **Misener R.*** Deterministic Global Optimisation for Process Optimisation. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; Invited by Prof N Shah; 12/2014.

I04 **Misener R.***, Floudas C. A. Special Mathematical Structure Detection and Exploitation with ANTIGONE. *Global Optimisation Workshop*, London, UK; Invited by Dr P Parpas; 12/2013.

I03 **Misener R.*** Architecting ANTIGONE: Design Choices and Tradeoffs. *MODAL Workshop on MINLP Solver Technology*, Zuse-Institut Berlin, DE; Invited by Mr A Gleixner; 11/2013.

I02 **Misener R.***, Floudas C. A. Globally Optimising Process Networks with ANTIGONE: Automatic Recognition and Adaptation Strategies. *COST Workshop on Mixed Integer Nonlinear Programming*, Paris, FR; Invited by Prof L Liberti; 10/2013.

I01 **Misener R.***, Floudas C. A. ANTIGONE: A general mixed-integer nonlinear global optimisation framework. *4^{th} International Conference on Continuous Optimization*, Lisbon, Portugal; Invited by Prof A Mitsos; 07/2013.

Contributed Conference & Workshop Presentations [*presenter]

P61 Odgers J., Kappatou C. D., **Misener R.**, Garcá-Muñoz S., Filippi S. Uncertainty Propagation for Probabilistic Prediction in Partial Least Squares Using Bootstrap Methods. *AIChE Annual Meeting*; 11/2022.

P60 Kappatou C. D., Odgers J., García-Muñoz S., **Misener R.** Optimization-Based Approaches for Explainable, Automated Chemometric Models. *AIChE Annual Meeting*: 11/2022.

P59 Kappatou C. D., Odgers J., García-Muñoz S., **Misener, R.** Optimization Methods for Exploring Accuracy Versus Robustness of a Regression Prediction in Process Analytical Technology. AIChE Annual Meeting, 11/2022.

P58 Kappatou, C. D., García-Muñoz, S., Odgers, J., **Misener, R.** Towards Automation and Robustification of Chemometric Models, 22nd IFPAC Annual Meeting, North Bethesda, USA, 06/2022.

P57 Folch J. P., Tsay C., van der Wilk M., Shafei B., Walz D., Niederle A., **Misener R.** Design of flow chemistry experiments using batch Bayesian optimization. *AIChE Annual Meeting*, Boston, USA; 11/2021.

P56 Tsay C., Kronqvist J., Thebelt A., **Misener R.** Training and Reformulating Neural Network Surrogate Models for Optimization. *AIChE Annual Meeting*, Boston, USA; 11/2021.

P55 Tsay C., Ceccon F., **Misener R.** Formulations and Restrictions for the Pooling and Multiperiod Pooling Problems. *AIChE Annual Meeting*, Boston, USA; 11/2021.

P54 Wiebe J., **Misener R.** ROModel: Modelling Robust Optimization Problems in Pyomo. *AIChE Annual Meeting*, Boston, USA; 11/2021.

P53 Kronqvist J., **Misener R.**, Tsay C. Between steps: Intermediate relaxations between big-M and convex hull formulations. *International Conference on Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, 2021. **Distinguished Paper Award**, Video link

P52 Wiebe J.*, **Misener R.** ROmodel: A Python Robust Optimization Modeling Toolbox. *31st European Symposium on Computer Aided Process Engineering*, Istanbul, TR, 06/2021. Video link

P51 Sedgwick R.*, Goertz J., **Misener R.**, Stevens M, van der Wilk M. Design of Experiments for Verifying Biomolecular Networks. *Machine Learning for Molecules NeurIPS Workshop*. 12/2020. Video link

P50 Wiebe J., Dunlop J., Cecílio I., **Misener R.** A Robust Approach to Warped Gaussian Process-Constrained Optimization. *Virtual AIChE Annual Meeting*; 11/2020. Video link

P49 Olofsson S.*, **Misener R.** Design of Dynamic Experiments for Model Discrimination Under Uncertainty Using Gaussian Process Surrogate Models. *AIChE Annual Meeting*, Orlando, USA; 11/2019.

P48 Wiebe J.*, Cecílio I., **Misener R.** The robust pooling problem. *29th European Symposium on Computer Aided Process Engineering*, Eindhoven, NL, 06/2019.

P47 Cyras K.*, Letsios D., **Misener R.**, Toni F. Argumentation for Explainable Scheduling. *33rd AAAI Conference on Artificial Intelligence (AAAI-19)*, Hawaii, HI, 01/2019.

P46 Wiebe J.*, Cecílio, I., **Misener R.** Robust Planning and Scheduling for Processes with Equipment Degradation. *AIChE Annual Meeting*, Pittsburgh, USA; 10/2018.

P45 Baltean-Lugojan R., Bonami P., Tramontani A., **Misener R.*** Online Generation Via Offline Selection of Strong Linear Cuts from a Semidefinite Programming Relaxation. *AIChE Annual Meeting*, Pittsburgh, USA; 10/2018.

P44 Wiebe J.*, Cecílio I., **Misener R.** Data-driven optimization of processes with degrading equipment, *3rd PSE@ResearchDayUK*, Imperial, UK, 09/2018.

JW awarded 2nd Presentation Prize (13 entries)

P43 Olofsson S.*, Deisenroth M. P., **Misener R.** Design of Experiments for Model Discrimination Hybridising Analytical and Data-Driven Approaches. *International Conference on Machine Learning (ICML)*, Stockholm, SE; 07/2018. *Long 20 minute presentation*

P42 Olofsson S.*, Deisenroth M. P., **Misener R.** Optimal Design of Experiments for Model Discrimination using Gaussian Process Surrogate Models. *13*th *International Symposium on Process Systems Engineering*, San Diego, USA; 07/2018.

P41 Wesselhoeft C., Ham D., **Misener R.*** Algorithms for Mixed-Integer Optimization Constrained by Partial Differential Equations. *13*th *International Symposium on Process Systems Engineering*, San Diego, USA; 07/2018.

P40 Mistry M., **Misener R.*** Integrating Mixed-Integer Optimisation and Satisfiability Modulo Theories. *AIChE Annual Meeting*, Minneapolis, USA; 10/2017.

P39 Olofsson S.*, Mehrian M., Geris L., Calandra R., Deisenroth M. P., **Misener R.** Bayesian Multi-Objective Optimisation of Neotissue Growth in a Perfusion Bioreactor Set-Up. *27th European Symposium on Computer Aided Process Engineering*, Barcelona, ES, 06/2017.

P38 Kouyialis G., Letsios D.*, **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. *Department of Computing Research Associate Symposium*, London, UK; 06/2017.

DL awarded 2nd **Prize, Top Symposium Presenter (10 entries)**

P37 Baltean-Lugojan R.*, **Misener R.** Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness. *Computational Management Science*, Bergamo, IT; 05/2017.

P36 Olofsson S.*, Mehrian M., Geris L., Calandra R., Deisenroth M. P., **Misener R.** Bayesian Multi-Objective Optimisation of Neotissue Growth in a Perfusion Bioreactor Set-Up. *5th Belgian Symposium on Tissue Engineering*, Leuven, BE; 05/2017.

P35 Baltean-Lugojan R.*, **Misener R.** Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness. *Mathematical Optimization in the Decision Support Systems for Efficient and Robust Energy Networks Final Conference*, Modena, IT; 03/2017.

P34 Baltean-Lugojan R., **Misener R.** Deterministic Global Optimization of Large-Scale Pooling Problems Via Topological Branch-and-Bound. *AIChE Annual Meeting*, San Francisco, CA; 11/2016.

P33 Ceccon F., **Misener R.*** Using Functional Programming to Recognize Named Structure in an Optimization Problem: Application to Pooling. *AIChE Annual Meeting*, San Francisco, CA; 11/2016.

P32 Kouyialis G.*, **Misener R.** Detecting symmetry in designing heat exchanger networks. *1st PSE@ResearchDayUK*, Imperial, UK, 07/2016.

P31 Ulmasov D.*, Baroukh C., Chachuat B., Deisenroth M. P., **Misener R.** Bayesian Optimisation with Dimension Scheduling Algorithm: Application to Biological Systems. *26th European Symposium on Computer Aided Process Engineering*, Portorož, SI, 06/2016.

P30 Mistry M.*, **Misener R.** Solving MINLP with Heat Exchangers: Special Structure Detection and Large-Scale Global Optimisation. *AIChE Annual Meeting*. Salt Lake City, UT, 11/2015.

P29 Allenby M. C.*, Tahlawi A., Brito Dos Santos S., **Misener R.**, Hwang Y., Panoskaltsis N., Mantalaris A. Development of a hematopoietic microenvironment for the production of red blood cells (RBCs) in a novel 3D hollow fibre bioreactor. *TERMIS*. Boston, MA, 09/2015.

P28 Fuentes-Garí M.*, **Misener R.**, Georgiadis M. C., Kostoglou M., Pistikopoulos E. N., Panoskaltsis N., Mantalaris A. Chemotherapy Optimization in Leukemia: Selecting the Right Mathematical Models for the Right Biological Processes. *9th IFAC Symposium on Biological & Medical Systems*. Berlin, DE; 09/2015

P27 **Misener R.**, Mistry M.* Solving MINLP with Heat Exchangers: Special Structure Detection and Large-Scale Global Optimisation. *13th EUROPT Workshop on Advances in Continuous Optimisation*, Edinburgh, UK; 07/2015.

P26 **Misener R.***, Fuentes-Garí M., Allenby M. C., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Stem Cell Bioprocessing under Uncertainty: A Case Study in Optimising Red Blood Cell Production. *17th British-French-German Conference on Optimization.* London, UK; 06/2015.

P25 Savvopoulos S. V.*, **Misener R.**, Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Global Sensitivity Analysis for a Dynamic Model of Chronic Lymphocytic Leukemia Disease Trajectories. *12th International Symposium on Process Systems Engineering.* Copenhagen, DK; 06/2015.

P24 **Misener R.***, Fuentes-Garí M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Robust Design and Operation of Red Blood Cell Production in a Parallelised Hollow Fibre Bioreactor. *AIChE Annual Meeting.* Atlanta, GA; 11/2014.

P23 Velliou E., Brito Dos Santos S., Fuentes-Garí M.*, **Misener R.**, Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Towards *in vitro* Optimization of Chemotherapy for Leukaemia Under Environmental Stress: Moving from 2- to 3-Dimensional Cultures. *AIChE Annual Meeting.* Atlanta, GA; 11/2014.

P22 Fuentes-Garí M.*, **Misener R.**, García-Münzer D., Velliou E., Georgiadis M. C., Kostoglou M., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Towards Personalized Treatments for Leukemia Based on Cell Cycle Heterogeneity: An Experimental/Modeling Approach. *AIChE Annual Meeting.* Atlanta, GA; 11/2014.

P21 **Misener R.***, Fuentes-Garí M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Robust Design and Operation of Red Blood Cell Production in a Parallelised Hollow Fibre Bioreactor. *INFORMS Annual Meeting.* San Francisco, CA; 11/2014.

P20 Velliou E., Fuentes-Garí M., **Misener R.***, Pefani E., Rende M., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. A framework for the design, modeling and optimization of biomedical systems. *Foundations of Computer-Aided Process Design.* Cle Elum, WA; 07/2014.

P19 **Misener R.***, Chin J., Lai M., Fuentes-Garí M., Velliou E., Panoskaltsis N., Pistikopoulos E. N., Mantalaris A. Robust Superstructure Optimisation of a Bioreactor that Produces Red Blood Cells. *24th European Symposium on Computer Aided Process Engineering.* Budapest, Hungary; 06/2014.

P18 **Misener R.***, Floudas C. A. ANTIGONE: Algorithms for coNTinuous / Integer Global Optimization of Nonlinear Equations. *AIChE Annual Meeting*, San Francisco, CA; 11/2013.

P17 Fuentes-Garí M.*, Velliou E., **Misener R.**, Britos dos Santos S., Panoskaltsis N., Mantalaris A., Pistikopoulos E. N. Towards a Personalised Treatment of Acute Myeloid Leukaemia: The Impact of Considering the Cell Cycle. *AIChE Annual Meeting*, San Francisco, CA; 11/2013.

P16 Li J.*, Xiao X., **Misener R.**, Floudas C. A. Effective Global Optimization Methods for Total Refinery Planning Operations. *AIChE Annual Meeting*, San Francisco, CA; 11/2013.

P15 Floudas C. A., **Misener R.*** Globally Optimizing Mixed-Integer Quadratically-Constrained Quadratic Programs: Advances in GloMIQO. *AIChE Annual Meeting*, Pittsburgh, PA; 10/2012.

P14 Floudas C. A.*, **Misener R.** Globally Optimizing Mixed-Integer Signomial Programs. *AIChE Annual Meeting*, Pittsburgh, PA; 10/2012.

P13 Floudas C. A.*, **Misener R.** A Global Optimization Framework for Mixed-Integer Signomial Programs. *INFORMS Annual Meeting*, Phoenix, AZ; 10/2012.

P12 Floudas C. A.*, **Misener R.** Globally Optimizing Mixed-Integer Quadratically-Constrained Quadratic Programs (MIQCQP). *21st International Symposium on Mathematical Programming*, Berlin, DE; 08/2012.

P11 Floudas C. A.*, **Misener R.** GloMIQO: Global Mixed-Integer Quadratic Optimizer. *European Conference on Operational Research*, Vilnius, Lithuania; 07/2012.

P10 Floudas C. A.*, **Misener R.** A Framework for Solving Mixed-Integer Quadratically-Constrained Quadratic Programs (MIQCQP). *INFORMS International*, Beijing, China; 06/2012.

P09 **Misener R.***, Floudas C. A. Global Optimization of Mixed-Integer Quadratically-Constrained Quadratic Programs (QCQP) Through Piecewise-Linear and Edge-Concave Relaxations. *AIChE Annual Meeting*, Minneapolis, MN; 10/2011.

P08 Baliban R.*, Elia J. A., **Misener R.**, Floudas C. A. Global Optimization of Thermochemical-Based Coal, Biomass, and Natural Gas to Liquids Processes Via Logarithmic Partioning Schemes. *AIChE Annual Meeting*, Minneapolis, MN; 10/2011.

P07 Li J.*, **Misener R.**, Floudas C. A. Scheduling of Crude Oil Operations Under Uncertainty: A Robust Optimization Framework Coupled with Global Optimization. *AIChE Annual Meeting*, Minneapolis, MN; 10/2011.

P06 **Misener R.***, Thompson J. P., Floudas C. A. Large-Scale Global Optimization of Generalized and Extended Pooling Problems: Methods and Computational Tools. *AIChE Annual Meeting*, Salt Lake City, UT; 2010.

P05 **Misener R.***, Floudas C. A. Globally Optimal Nesting of Irregular Shapes into a Limited Resource. *AIChE Annual Meeting*, Salt Lake City, UT; 11/2010.

P04 Li J.*, **Misener R.**, Floudas C. A. A New Modeling and Global Optimization Approach for Scheduling of Crude Oil Operations. *AIChE Annual Meeting*, Salt Lake City, UT; 11/2010.

P03 **Misener R.***, Thompson J. P., Floudas C. A. Algorithms and Computational Tools for Globally Optimizing Large-Scale Pooling Problems. *Graduate Student Symposium*, Princeton, NJ; 10/2010.

P02 **Misener R.***, Floudas C. A. Global Optimization of Large-Scale Extended Pooling Problems with the EPA Complex Emissions Model. *AIChE Annual Meeting*, Nashville, TN; 11/2009.

P01 **Misener R.***, Gounaris C. E., Floudas C. A. Computational Comparison of Piecewise Linearization Schemes in Gas Lifting and Pooling Operations. *AIChE Annual Meeting*, Philadelphia, PA; 11/2008.

Teaching

Operations Research Imperial
Course Leader Joint with Dr G Casale (2016-19) and Dr D Paccagnan (2021-). Nominated for **2017 Best Teaching for Undergraduates** and finalist for **2018 Best Teaching for Postgraduates**.
2016-19, 2021 –

Computing for Optimal Decisions Imperial
Course Leader Joint with Dr P Parpas. Finalist for **2016 Best Innovation in Teaching**, Imperial Student Academic Choice Award. The teaching innovation recognition is due to how frequently I discuss research in the classroom. *2014 –*

Advanced Optimisation Short Course Imperial
Lecturer Lead the *Global Optimisation* module of the Centre for Process Systems Engineering Short Course for Industry Professionals. *2015, 2016*

Beginning Algebra Albert C. Wagner Youth Correctional Facility
Volunteer Instructor Team teach Mercer County Community College MAT 033 (Summer 2011; Spring 2012) & MAT 037 (Fall 2010; Spring 2011; Fall 2011) for the Princeton Prison Teaching Initiative. Activities: lecturing, developing worksheets, supervising tutorials, grading. *2010-12*

Design, Synthesis, & Optimization of Chemical Processes Princeton
Assistant in Instruction Assisted students in modelling the conversion biomass & coal to gasoline for the capstone undergraduate Chemical Engineering process design course. Led tutorials covering Aspen & GAMS software. Received **Excellence in Teaching Award** from the School of Engineering & Applied Sciences. *Fall 2009*

Chemical & Biological Engineering Laboratory MIT
Teaching Assistant Advised a team of students in modelling a biological reactor using computational fluid dynamics with the software package FLUENT. *Spring 2007*

Introduction to Chemical Engineering MIT
Grader Reviewed student problem sets. *Fall 2004 & 2005*

Research Mentoring for Research Fellows

In the UK, *Research Fellow* is intermediate between *Postdoctoral Associate* and *Lecturer* (Assist Prof). I collaborate with research fellows and assist in developing their independent research careers.

Completed

Dr Jan Kronqvist *2019-21*
Funding Royal Society Newton International Fellowship, Swedish Cultural Foundation in Finland
Awarded Distinguished Paper Award at CPAIOR 2021, Selected to present in Parliament as part of the 2021 STEM for Britain competition (Video link)
Now Assistant Professor at the KTH Royal Institute of Technology

Dr Calvin Tsay *2020-22*
Funding EPSRC David Clarke Postdoctoral Fellowship, Imperial College Research Fellowship
Awarded Distinguished Paper Award at CPAIOR 2021, 2022 COIN-OR Cup for OMLT
Now Lecturer (Assistant Professor) at Imperial

Research Mentoring for Postdoctoral Associates

Current

Dr Juan Campos Salazar *2018-20,22-*
Contributed to the GALINI EPSRC project, now contributing to ADOPT EPSRC.

Dr Jixiang Qing *2023-*
Funded by the EPSRC / BASF Prosperity Partnership

Completed

Dr Richard Oberdieck *2015-16*
Contributed to the UΨ^2 EPSRC project. Primary supervisor was Prof E Pistikopoulos.
Now Lead Data Scientist, Banking Circle.

Dr Dimitrios Letsios *2016-19*
Contributed to the UΨ^2 EPSRC project.
Awarded 2$^{\text{nd}}$ Presentation Prize at the 2017 Department of Computing Research Associate Symposium, Best (Innovative) Demo at AAMAS 2020
Now Lecturer (Assistant Professor) in the Department of Informatics, Kings College London.

Dr Kristijonas Cyras *2017-20*
Contributed to the ROAD2H EPSRC project. Primary supervisor was Prof F Toni. I contributed to the optimisation side of Dr Cyras' work.
Awarded Best (Innovative) Demo at AAMAS 2020
Now AI Researcher at Ericsson.

Dr Miten Mistry *2020*
Contributed to the ROAD2H EPSRC project.
Now minimax labs

Dr Francesco Ceccon *2021*
Contributed to the GALINI EPSRC project.
Awarded 2022 COIN-OR Cup for OMLT
Now Co-Founder, Auclantis

Dr Chrysoula Kappatou *2020-23*

Contributed to the Eli Lilly / EPSRC partnership.
Selected to the 2021 MIT Rising Stars in Chemical Engineering programme
Now Data Scientist, BASF

Dr Ruby Sedgwick *2023-25*
Funded by the Wellcome Trust.
Now Research Scientist, Xyme

Research Mentoring for PhD Candidates

Current

Shiqiang Zhang *2021-*
Funded by an Hans Rausing Scholarship.

Toby Boyne *2023-*
Funded by BASF & the EPSRC CDT StatML.

Completed

Dr Georgia Kouyialis *2014-18*
Exploiting Symmetry in Mixed-Integer Nonlinear Optimisation. Funded by EPSRC Doctoral Training Account Studentship.
Awarded 3rd prize for 1st year PhD students in the 2015 Departmental Google Poster Competition, FOCAPO/CPC 2017 Travel Award, 1st Poster Prize at the 2017 PSE@ResearchDayUK, 2nd Poster Prize at the 2017 CPSE Annual Meeting, 1st Poster Prize at the UK/Ireland Annual SIAM Meeting.
Now Data Science Consultant at Dataiku.

Dr Radu Baltean-Lugojan *2015-19*
Exploiting Structure in Nonconvex Quadratic Optimisation. Funded by EPSRC Doctoral Training Account Studentship.
Awarded 2nd prize for 1st year PhD students in the 2016 Departmental Google Poster Competition, 2017-18 IBM PhD Fellowship
Now Portfolio Manager at Eisler Capital.

Dr Simon Olofsson *2016-20*
Gaussian Processes for Hybridisation of Analytical and Data-Driven Approaches for Design of Experiments. Funded by ModLife (EU H2020 675251).
Awarded Best Quality Poster for 2nd year PhD students in the 2018 Departmental Google Poster Competition. Selected to present in Parliament as part of the 2019 STEM for Britain competition.
Now Software Engineer at Meta.

Dr Miten Mistry *2015-20*
Branching strategies for mixed-integer programs containing logical constraints and decomposable structure. Funded by HiPEDs EPSRC Centre for Doctoral Training.
Awarded 2015 Donald Davies Memorial Prize for MEng thesis excellence. Selected to present in Parliament as part of the 2019 STEM for Britain competition.
Now minimax labs.

Dr Francesco Ceccon *2016-21*
Funded by the EPSRC.
Now Co-Founder, Apibara.

Dr Johannes Wiebe *2017-21*
Funded by Schlumberger & HiPEDs EPSRC Centre for Doctoral Training.
Awarded 2nd Presentation Prize at the 2018 PSE@ResearchDayUK, 3rd Poster Prize at the 2019 CPSE Annual Meeting.
Now Flexciton

Dr Alexander Thebelt *2019-23*
Funded by BASF.
Awarded 1st Poster Prize at the 2019 CPSE Annual Meeting, 2022 COIN-OR Cup for OMLT.
Now Machine Learning Engineer, QuantCo

Dr Ruby Sedgwick *2019-23*
Funded by EPSRC CDT AI4Health. Co-supervisor with Prof M Stevens (Department of Materials).
Awarded 3rd Poster Prize BioMedEng22.
Now Research Scientist, Xyme

Dr Jose Folch *2020-24*
Funded by BASF & the EPSRC CDT StatML. Co-supervised with Dr Mark van der Wilk.
Awarded 2023 Best Paper, *Computers & Chemical Engineering*
Now Chief Scientific Officer and Co-Founder, SOLVE

Dr James Odgers *2020-25*
Funded by the Eli Lilly / EPSRC partnership. Co-supervised with Dr Sarah Filippi (Department of Mathematics).
Now Postdoc, Helmholtz Munich

Imperial Department of Chemical Engineering

Dr María Fuentes-Garí *2012-15*
Population Balance Model of the Leukaemia Cell Cycle for Optimising Chemotherapy Treatments; Supervisors: Prof A Mantalaris and Prof E Pistikopoulos, we collaborated on cell cycle modelling.
Now Senior Consultant at Process Systems Enterprise.

Dr Symeon Savvopoulos *2013-18*
Mathematical Modelling of Chronic Lymphocytic Leukaemia; Supervisors: Prof A Mantalaris and Prof E Pistikopoulos, our collaboration was on Modelling Disease Trajectories for CLL.
Now Postdoctoral associate at KU Leuven.

Research Mentoring for Masters & UG Project Students

Miten Mistry MEng, *2014-15*
Thesis published in *Computers & Chemical Engineering* (J25).
MM awarded 2015 Donald Davies Memorial Prize for MEng thesis excellence

Balarabe Ogbeha BEng, *2014-15*

Francesco Ceccon MSc, *2015*
Thesis published in *AIChE Journal* (J26).

Jiaying Li MSc, *2015*

Doniyor Ulmasov Joint with Dr M P Deisenroth. MSc, *2015*
Collaboration with Dr B Chachuat and Dr C Baroukh. Thesis published at *ESCAPE* (E17).

Chia (Joel) Choo Joint with Dr L Nardi and Prof P Kelly. MRes Project, *2015*

Melinda Chan MSc, *2016*

Karlson Lee Joint with Dr A Faisal. MSc, *2016*

Pierre Thary MSc, *2016*

Chase Hellemans MEng, *2016-17*

Jakub Grzegorek MEng, *2016-17*

Pingchuan Ma MSc Independent Study Option, *2017*

Christian Wesselhoeft MSc Independent Study Option & MSc thesis, *2017*
Joint with Dr D Ham. Thesis published at *PSE* (E22).
CW awarded 2017 Winton Capital Applied Computing MSc Project Prize

Anna Collins Joint with Prof F Toni. Undergraduate Research Opportunities Programme, *2017, 2018*

Julius Hense Undergraduate project, *2017-18*

Natasha Page MSc, *2018*
Thesis published at *COCOA* (C03) & in the *Journal of Scheduling* (J45).
NP awarded *Runner up*, 2019 May Hicks Award from the Operational Research Society

Michael Radigan MEng, *2017-18*

Sarah Wang MSc, *2018*

Shudian Zhao MSc, *2018*

Chun (Nick) Li BEng, *2018-19*

Kunlong Chen MSc Independent Study Option, *2019*

Suraj G MEng, *2018-19*
Thesis published in the *Journal of Scheduling* (J45).
SG awarded 2019 NewVoice Media Prize for Computing MEng thesis excellence

Chun Li BEng, *2018-19*

Abigail Annkah MSc, African Institute for Mathematical Sciences, *2019*

Cornelius Braun MSc, *2022*

Jiaqi Zhao MSc, *2022*

Venus Cheung MSc, *2022*

Adi Prasad Undergraduate Research Opportunities Programme, *2022*

Clara Stoddart MEng, *2022-23*

Lauren Shrack MIT International Research Opportunities Programme, *2023*

Stefan Savulescu MEng, *2023-24*

Antoine Calame MSc, *2024*

Omar Alkhatib MEng, *2024-*

Prior Assistance in Mentoring

Final-Year Undergraduate Research Project Supervision
Imperial: Karan Gupta, Clara Hedegaard, Eleanor Shead, Thomas Wiggins; joint with Prof A Mantalaris. Thesis of KG & TW published in *AIChE Journal* (J32), 2013. *Princeton*: Philip Miller; joint with Prof C A Floudas, 2011-2012

Habib Adebisi Abubakar Joint with Prof C Adjiman. MSc, *2013-14*

Nikolaos Stefanopoulos Joint with Prof A Mantalaris and Prof E Pistikopoulos. MSc, *2013-14*

Financial Support Secured

Fellowships

BASF/Royal Academy of Engineering Research Chair 2022 - 2027
Title: *Data-Driven Optimisation*; £216k (PI)

Engineering & Physical Sciences Research Council Early Career Fellowship 2017 - 2022
Title: *GALINI: Global ALgorithms for mixed-Integer Nonlinear optimisation of Industrial systems*
Software development for novel engineering research; Includes 6 years postdoc funding; £984k (PI)

Royal Academy of Engineering Research Fellowship 2012 - 2017
Support for engineers to develop an academic research career; £539k (PI)

Imperial College Junior Research Fellowship 2012 - 2015
Sustain early career researchers (declined); £114k (PI)

USA National Science Foundation Graduate Research Fellowship 2007 - 2012
Support for graduate students in STEM; $120k (PI)

Princeton University Gordon Y. S. Wu Fellowship; $12k 2007 - 2009

Fellowships to my team members

EPSRC David Clarke Postdoctoral Research Fellowship 2020 - 2023
Fellow Dr C Tsay developed his independent research and collaborated with my team; £351k

Imperial College Research Fellowship 2020 - 2024

Fellow Dr C Tsay developed his independent research and collaborated with my team; £195k

Newton International Fellowship from the Royal Society 2019 - 2021
Fellow Dr J Kronqvist developed his independent research and collaborated with my team; £99k

Prognosis for Fault Diagnosis 2017 - 2021
EPSRC Industrial CASE Studentship from Schlumberger to PhD student J Wiebe; £27.5k

Cutting Planes for Global Optimisation 2017 - 2018
IBM Fellowship to PhD student R Baltean-Lugojan; £25k

Grants

Computer-aided molecular design with data-driven models 2024 - 2025
BASF. 1 year funding for a PhD student; £42k (PI)

Space optimization for NHM Unlocked 2024
Natural History Museum. 6 months postdoctoral funding (PI).

Collaborative Computational Modelling at the Interface (CCMI) 2024 - 2033
EPSRC Centre for Doctoral Training led by Prof T Betcke (UCL) and Prof C Cotter (Imperial). RM is one of 8 co-directors and one of 2 Directors of Research (co-I).

AlChemy: AI for Chemistry Hub 2024 - 2029
EPSRC AI Hub led by Prof K Jelfs (Imperial) and Prof A Cooper (Liverpool). RM is one of six co-directors; £12M (coI)

Innovative Continuous Manufacturing for Industrial Chemicals (IConIC) 2023 - 2028
EPSRC Prosperity Partnership with BASF. Professor M Hii from Imperial Chemistry is PI. To RM: 6 years of postdoctoral funding; £6.865M (coI)

Data-driven optimization of hierarchical systems 2023 - 2026
BASF. 1 PhD studentship (part-funded with the StatML CDT); £115k (PI)

Surveillance Suite for Targeting Interventions to Cholera Outbreaks 2023 - 2026
Wellcome Trust. Prof M Stevens from Imperial Materials is PI. To RM: 18 months postdoctoral funding; £2.683M (coI)

ADOPT: Advancing optimisation technologies 2022 - 2026
EPSRC. Prof B Chachuat from Imperial Chemical Engineering is PI. To RM: 24 months postdoctoral funding; £1.318M (coI)

Time-Indexed, Batch Bayesian Optimization for Flow Chemistry 2020 - 2024
BASF. 1 PhD studentship (part-funded with the StatML CDT); £104k (PI)

Transforming synthetic drug manufacturing: novel processes, methods & tools 2019 - 2027
EPSRC Prosperity Partnership with Eli Lilly. Prof C Adjiman from Imperial Chemical Engineering is PI. To RM: 3 years postdoctoral funding, 4 years PhD funding; £4.182M (coI)

Modern Statistics and Statistical Machine Learning at Imperial & Oxford 2019 - 2027
EPSRC Centre for Doctoral Training. Prof A Gandy from Imperial Maths is PI. I am the Department of Computing coI and an *Industry Liaison*; £6.159M (coI)

Global optimisation with ensemble machine learning models 2019 - 2022
BASF. 1 PhD studentship; £270k (PI)

Digital Media Data Analytics 2018 - 2019
Innovate UK (TS/R018537/1). Investigators: Dr A Field (PI), Dr M P Deisenroth, Dr R Misener (coI). To DoC: 1 year postdoctoral funding; £117k (coI)

BASF Research Project 2017
BASF. To RM: 4.2 months PhD funding; £40k (PI)

ROAD2H: Resource Optimisation, Argumentation, Decision Support & Knowledge Transfer to Create Value via Learning Health Systems 2017 - 2020
EPSRC EP/P029558/1. Investigators: Prof A Darzi (PI), Dr K Chalkidou, Dr V Curcin, Prof B Delaney, Dr R Li, Dr J Marti, Dr B Marovic, Dr R Misener (coI), Mr J Symons, Prof F Toni (Computing PI). To FT & RM: 3 years postdoctoral funding; £1.516M (coI)

Parallelising Mixed-Integer Optimisation: Energy Efficiency Applications 2017 - 2018

EPSRC First Grant Scheme. To RM: 1 year Research Associate Funding, 3 hours per week; £101k (PI)

ModLife 2015 - 2019
EU H2020 675251. Investigators: Prof A Mantalaris (PI), Dr R Misener (coI), European Commission (H2020-MSCA-ITN-2015); To RM: 3 years PhD funding & 5 hours per week; £507k (coI)

SyMBioSys: Systematic Models for Biological Systems Engineering 2015 - 2019
EU H2020 675585. Investigators: Prof A Mantalaris (PI), Dr R Misener (coI), Dr N Panoskaltsis, European Commission (H2020-MSCA-ITN-2015); To RM: 5 hours per week; £507k (coI).

UΨ^2: Uncertainty-Aware Planning and Scheduling in the Process Industries 2015 - 2019
EPSRC EP/M028240/1. Investigators: Dr V Dua, Dr R Misener (coI), Prof L Papageorgiou (PI), Dr P Parpas (Imperial PI), Dr E Pistikopoulos, Dr W Wiesemann, EPSRC; To RM: 3.5 years RA funding & 3.8 hours per week; £765k (coI)

Internal Funding

UKRI Impact Acceleration Funding, £71.7k (PI) 2022

Data Science Institute Seed Funding in Probabilistic Modelling, £20k (PI) 2018

Thesis Committees

Habilitation à Diriger des Recherches (2 external)

Dr Amélie Lambert — École doctorale Sciences des Métiers de l'Ingénieur — 11/2021
Exact solutions of polynomial programs through quadratic convex reformulations

Dr Claudia D'Ambrosio — Université Paris 13 — 07/2018
Solving well-structured MINLP problems

PhD (7 external, 8 internal)

Dr Miriam Sarkis — Imperial — 10/2024
Uncertainty-aware decision-support tools for next-generation pharmaceutical supply chains

Dr Liding Xu — École Polytechnique — 12/2023
Relaxation methods for mixed-integer nonlinear programming

Dr Chrysoula Kappatou — RWTH Aachen — 11/2020
Dynamic Optimization Strategies for Monoclonal Antibody Production

Dr Mohammad Mehrian — Université de Liège — 01/2019
Development and optimization of in silico models of 2D cell expansion and 3D neotissue formation in the context of tissue engineering therapy design and translation

Dr Jean Kossaifi — Imperial — 11/2018
Machine learning methods for face modelling and analysis in-the-wild

Dr Jan Kronqvist — Åbo Akademi University — 09/2018
Polyhedral Outer Approximations in Convex Mixed-Integer Nonlinear Programming

Dr Robert Walecki — Imperial — 06/2018
Structured Machine Learning Methods for Automated Analysis of Facial Expressions

Dr Styliani Avraamidou — Imperial — 02/2018
Mixed-Integer Multi-level Optimization through Multi-Parametric Programming

Dr Ahmadreza Marandi — University of Tilburg — 12/2017
Aspects of Quadratic Optimization: Nonconvexity, Uncertainty, and Applications

Dr Juan Campos Salazar — Imperial — 11/2017
A multigrid approach to SDP relaxations of sparse polynomial optimization problems

Dr Fabian Rigterink — University of Newcastle — 05/2017
Pooling Problems: Advances in Theory and Applications

Dr Nikos Diangelakis — Imperial — 03/2017
Model-based multi-parametric programming strategies towards the integration of design, control and operational optimization

Dr Carlos Perez Galvan University College London 02/2017
Global Optimisation for Dynamic Systems using Novel Overestimation Reduction Techniques

Dr Tiberiu Chis Imperial 04/2016
Performance modelling with adaptive hidden Markov models and discriminatory process sharing queues

Dr Ioana Nascu Imperial 04/2016
Advanced multiparametric optimization and control studies for anaesthesia

Professional Service

Leadership in my Research Community

***Vice Chair*, INFORMS Optimization Society** 2020 - 21
I was Vice Chair for ***Computational Optimization & Software***

***Member*, GAMS Advisory Board** 2018 - 25
Provide advice to the GAMS Development Corporation.

***Programming Coordinator*, AIChE Computing & Systems Technology Division** 2018 - 21
I am 10C (Systems & Process Operations) programming coordinator for 2021. For the years 2019 - 20, I assisted the current programming coordinator.

***Director*, AIChE Computing & Systems Technology Division** 2016 - 18
This is an elected post which several people hold simultaneously. During my tenure, I (i) overhauled the Student Travel Award, (ii) created an online Poster Kiosk to increase poster session prestige, (iii) initiated the Software Tools & Implementations session at the annual meeting, and (iv) reworked the Student Presentation Award process.

Management Committee Member, EU COST Action TD1207 2016 - 17
Mathematical Optimization for Efficient & Robust Energy Networks

Editorial Work

Associate Editor, Operations Research 2024 -
Areas: *Data, Software, and Computation* led by Prof T Ralphs
Optimization led by Prof S Burer and Prof D Iancu

Associate Editor, INFORMS Journal on Computing 2019 -
Area: *Design & Analysis of Algorithms*, led by Prof A Lodi

Associate Editor, Optimization and Engineering 2017 -

Editorial Board, EURO Journal on Computational Optimization 2021 -

Editorial Board, Computers & Chemical Engineering 2018 -
Previously: *Associate Editor* 2020-22

Editorial Board, Journal of Global Optimization 2018 - 20

Editorial Board, Mathematical Programming B 2018 - 21

Member, EPSRC Peer Review College 2017 -

Conference & Seminar Organisation

Organising Committee: SIAM Conference on Optimization (OP23) 2023
Organising Committee: 4th IMA & OR Society Conference on Maths of Operational Research 2023
Imperial Mixed-Integer Nonlinear Optimization Workshop (held virtually) 2021
Joint with Prof M Anjos, Dr P Belotti, Dr J Kronqvist
Dagstuhl Seminar on *Algorithms for Mixed-Integer Nonlinear Optimization* (18081) 2018
Joint with Dr P Bonami, Dr A Gleixner, Prof J Linderoth
Organise the Imperial Centre for Process Systems Engineering Seminar Series 2015; 2016; 2020
Organising Committee: 17th British-French-German Conference on Optimisation 2015

Program Committee Memberships

Area Chair, Conference on Neural Information Processing Systems NeurIPS 2024
35th AAAI Conference on Artificial Intelligence AAAI 2021
30th European Conference on Operational Research EURO 2019

Co-chair of the *Software for Optimization* stream

Integer Programming and Combinatorial Optimization (CORE A)	IPCO 2019
Foundations of Computer-Aided Process Design	FOCAPD 2019, 24

Chair of the FOCAPD 2019 *International Subcommittee*

Mixed-Integer Programming Workshop	MIP 2018
Process Systems Engineering	PSE 2018

Co-chair of the PSE 2018 *Optimization Methods & Computational Tools* theme

EUROPT Workshop on Advances in Continuous Optimization	EUROPT 2017, 18, 19
Computational Management Science	CMS 2017
European Symposium on Computer Aided Process Engineering	ESCAPE 2016-18, 21, 23
6$^{\text{th}}$ INFORMS Optimization Society Conference	IOS 2016

Sessions Chaired at Major International Conferences

Session Co-Chair, Software Tools and Implementations for Process Systems Engineering	AIChE 2021
Session Co-Chair, Interactive Session: Systems and Process Operations	AIChE 2021
Session Co-Chair, Advances in Optimization II	AIChE 2020
Session Co-Chair, CAST Director's Student Presentation Award Finalists	AIChE 2018
Session Co-Chair, Advances in Optimization Under Uncertainty	AIChE 2018
Session Chair, Optimization Methods & Computational Tools 1	PSE 2018
Session Co-Chair	ESCAPE 2018
Session Co-Chair, Advances in Optimization I	AIChE 2017
Session Chair, In memory of Christodoulos A. Floudas I, II, & III	EUROPT 2017
Session Co-Chair, Enabling Technologies I & II	FOCAPO 2017
Session Chair, Software Tools and Implementations for Process Systems Engineering	AIChE 2016
Session Co-Chair, Process Design II	AIChE 2016
Session Chair, Advances in Deterministic Global Optimization	ICCOPT 2016
Session Chair, Modelling, Numerical analysis, Simulation and Optimization	ESCAPE-26 2016
Session Chair, Software Tools and Implementations for Process Systems Engineering	AIChE 2015
Session Chair, Advances in Global Optimisation	ISMP 2015
Session Co-Chair, Modelling & Simulation	PSE-2015/ESCAPE-25 2015
Session Co-Chair: Supply Chain Optimization; Planning & Scheduling II	AIChE 2014
Invited Session Chair	INFORMS 2014
Poster Session Co-Chair	FOCAPD 2014

Other Participation

Panelist, RAEng Research Chair / Senior Research Fellowship Promotion Webinar	2024
Member, UKRI Turing AI World-Leading Researcher Fellowships panel (Round 3)	2024
Mentor, RAEng Research Fellowship Access Mentoring Programme	2023
Award Committee Chair, COIN-OR Cup	2023
Committee Chair, Student Paper Prize, *INFORMS Optimization Society*	2021
Award Committtee Member, Best Paper, *Journal of Global Optimization*	2018
Amazon Supply Chain Optimization Summit	09/10/2017
EPSRC Operational Research Theme Day	15/09/2015

Departmental & College Service

Member, BASF Strategic Partnership Committee	2022 -
Member, Departmental Hiring Committee	2022
Staff Ambassador for Women, Department of Computing	2022 -
Member, Departmental Promotions Committee	2021, 22
Member, Energy Futures Laboratory Technical Working Group	2017-20
Member, Department of Computing Equality, Diversity & Education Committee	2017-20
Member, Departmental Management Committee	2016-18, 2021-23

Peer Review

AAAI, ADCHEM, AIChE Journal, Chemical Engineering Research & Design, Computational Optimization & Applications, Computers & Chemical Engineering (**Top Reviewer, 2013, Top 10% in**

reviews completed, 2014 - 2015 & 2016 - 2017), Computers & Operations Research, European Journal of Operational Research, Fuel, Industrial & Engineering Chemistry Research, International Conference on Machine Learning, Journal of Global Optimization, Journal of Optimization Theory & Applications, Management Science, Mathematical Programming (A, B & C), NeurIPS (**Top Reviewer, 2022 & 2023**), Operations Research, Operations Research Letters, Optimization Letters, SIAM Journal on Optimization

Community Outreach & Service

Panelist, WISDOM (women's forum) at the *31st European Conference on Operational Research*	2021
Speed mentoring event for AnitaB.org at the Twitter London office	2018
Voice of the Future, pose questions to Ministers and scientific advisers in London Parliament	2016
Interviewed for a short film highlighting RAEng research activities	2015, 17
Panel Discussion Chair at the 1st ACM-W UK Inspire Celebration of Women in Computing	2015
Lecture at the Engineering Summer School for Girls	2015
Organise a booth at Imperial Festival highlighting the BSEL Blood Factory	2013, 15
Give public laboratory tours for the Biological Systems Engineering Laboratory	2012 - 2014
Teach Beginning Algebra at ACW Youth Correctional Facility	2010 - 2012
MIT Educational Counsellor; interview prospective MIT students	2007 - 2012
Co-facilitor and program participant at MIT LeaderShape	2006 - 2007

Affiliations

Senior Member, American Institute of Chemical Engineers	AIChE 2008 -
Member, British Computer Society	BCS 2017 -
Chartered Engineer	CEng 2019 -
Fellow	FBCS 2020 -
Member, Sargent Centre for Process Systems Engineering	CPSE 2014 -
Academic Fellow, Data Science Institute	DSI 2018 -
Member, Institute for Operations Research & Management Sciences	INFORMS 2014 -
Member, Tau Beta Pi – Engineering Honor Society	TBP 2007 -
The top 20% of MIT Engineering Undergraduates are eligible for TBP	