

RUTH MISENER
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RESEARCH DOMAIN: OPTIMISATION METHODS & COMPUTATION

FOUNDATIONS

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

APPLICATIONS

Bioprocess optimisation under uncertainty, Cell cycle modelling, Optimising energy efficiency of chemical & petrochemical plants, Process network design & operations, Scheduling

PROFESSIONAL APPOINTMENTS

| | | |
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| Imperial College | | London, UK |
| <i>Senior Lecturer</i> | Department of Computing | 2017- |
| <i>Lecturer</i> | Department of Computing | 2014-17 |
| <i>Royal Academy of Eng. Research Fellow</i> | Centre for Process Systems Engineering | 2012-14 |

EDUCATION

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|--|--|---------------|
| Princeton University | | Princeton, NJ |
| <i>PhD</i> in Chemical Engineering. Advised by Professor C. A. Floudas. | | 2012 |
| <i>Thesis Title:</i> Novel Global Optimization Methods: Theoretical & Computational Studies on Pooling Problems with Environmental Constraints | | |
| Massachusetts Institute of Technology | | Cambridge, MA |
| <i>Bachelor of Science</i> in Chemical Engineering; Minor in Political Science | | 2007 |

AWARDS

FELLOWSHIPS / SCHOLARSHIPS

| | |
|---|---------|
| Engineering & Physical Sciences Research Council Early Career Fellowship | 2017-22 |
| Royal Academy of Engineering Research Fellowship | 2012-17 |
| Imperial College Junior Research Fellowship (<i>declined in favour of the RAEng Fellowship</i>) | 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

| | |
|--|-----------------|
| Finalist for <i>Best Teaching for Postgraduates</i> , 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, <i>Innovation</i> Category | 2017 |
| Finalist for <i>Best Innovation in Teaching</i> , Imperial Student Academic Choice Award | 2016 |
| W. David Smith, Jr. Graduate Student Paper Award | 2014 |
| Best Paper of 2013, <i>Journal of Global Optimization</i> | awarded in 2014 |
| Top Reviewer, <i>Computers & Chemical Engineering</i> | 2013 |
| Best Poster, 2 nd Belgian Symposium on Tissue Engineering | 2013 |
| Excellence in Teaching, Princeton School of Engineering & Applied Sciences | 2010 |

AWARDS TO MY STUDENTS & ASSOCIATES

I am privileged to work with talented, motivated researchers. The following list is limited to my group members' achievements where I made some (often small!) contribution, e.g. as thesis supervisor.

| | | |
|---|------------------------|------|
| 1 st Poster Prize, UK/Ireland Annual Meeting of the Society for Industrial & Applied Mathematics | <i>Kouyialis</i> | 2018 |
| 2 nd Poster Prize, Centre for Process Systems Engineering Annual Industrial Consortium Meeting | <i>Kouyialis</i> | 2017 |
| Winton Capital Applied Computing MSc Project Prize | <i>Wesselhoeft</i> | 2017 |
| 1 st Poster Prize, PSE@ResearchDayUK | <i>Kouyialis</i> | 2017 |
| 2 nd Prize, Top Presentation at the Dept. of Computing Research Associate Symposium | <i>Letsios</i> | 2017 |
| IBM PhD Fellowship | <i>Baltean-Lugojan</i> | 2017 |
| FOCAPO/CPC Travel Grant | <i>Kouyialis</i> | 2017 |
| Prizes in Dept. of Computing Google Poster Competition | <i>Baltean-Lugojan</i> | 2016 |
| | <i>Kouyialis</i> | 2015 |
| Donald Davies Memorial Prize for MEng Thesis | <i>Mistry</i> | 2015 |
| 2 nd Prize, Nobuyuki Idei Young Entrepreneur Award | <i>Fuentes-Garí</i> | 2013 |

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.

SOFTWARE

S03 Misener R., Floudas C. A. [ANTIGONE](#): Algorithms for coNTinuous / Integer Global Optimization of Nonlinear Equations; 2013.

ANTIGONE is commercial through Princeton and the [GAMS Development Corp.](#)

S02 Misener R., Floudas C. A. [GloMIQO](#): Global Mixed-Integer Quadratic Optimizer; 2012.

GloMIQO is commercial through Princeton and the [GAMS Development Corp.](#)

[ANTIGONE/GloMIQO](#) is used for research and industry worldwide. Both are joint with Prof Floudas and commercial through Princeton/[GAMS](#).

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

APOGEE is a freely available tool for solving industrially-relevant pooling problems

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.

PEER-REVIEWED JOURNAL PAPERS ([GOOGLE SCHOLAR](#))

J33 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*, DOI 10.1016/j.compchemeng.2018.03.002, 2018. *In Press*

Invited article for a special issue in memory of Professor C. A. Floudas

- J32** 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*, DOI 10.1002/aic.16042, 2018. *In press*
The editors invited 50 future chemical engineering leaders to contribute research for Futures Series. My invitation is for the founding issue of a series that will run regularly.
- J31** Baltean-Lugojan R., Misener R., Piecewise Parametric Structure in the Pooling Problem – from Sparse Strongly-Polynomial Solutions to NP-Hardness, *Journal of Global Optimization*, DOI 10.1007/s10898-017-0577-y, 2018. *In press*.
Invited article for a special issue in memory of Professor C. A. Floudas
- J30** 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
- 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.
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.
- 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., Panoskaltis 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 α BB 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.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- C23** Olofsson S., Deisenroth M. P., **Misener R.** Optimal Design of Experiments for Model Discrimination using Gaussian Process Surrogate Models. *Accepted to Process Systems Engineering 2018.*
- C22** Wesselhoeft C., Ham D., **Misener R.** Algorithms for Mixed-Integer Optimization Constrained by Partial Differential Equations. *Accepted to Process Systems Engineering 2018.*
- C21** 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 España 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.
- C20** 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*

- C19** 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.
- C18** Allenby M. C., Tahlawi A., **Misener R.**, Brito dos Santos S., Mantalaris A., Panoskaltis 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.
- C17** 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.
- C16** Fuentes-Garí M., Zemenides S., **Misener R.**, Georgiadis M. C., Pistikopoulos E. N., Mantalaris A., Panoskaltis 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.
- C15** Allenby M. C., Tahlawi A., Brito Dos Santos S., Hwang Y. S., **Misener R.**, Panoskaltis 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.
- C14** Fuentes-Garí M., **Misener R.**, Georgiadis M. C., Kostoglou M., Pistikopoulos E. N., Panoskaltis N., Mantalaris A. Chemotherapy Optimization in Leukemia: Selecting the Right Mathematical Models for the Right Biological Processes. 9th IFAC Symposium on Biological & Medical Systems. Vol. 48 of *IFAC-PapersOnLine*. Berlin, DE; 2015; pp 534 - 539.
- C13** Allenby M. C., Tahlawi A., Brito Dos Santos S., **Misener R.**, Hwang Y., Panoskaltis 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.
- C12** Savvopoulos S. V., **Misener R.**, Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Global Sensitivity Analysis for a Dynamic Model of Chronic Lymphocytic Leukemia Disease Trajectories. In Gernaey et al. (Eds), 12th International Symposium on Process Systems Engineering. Vol. 37 of *Computer-Aided Chemical Engineering*. Copenhagen, DK; 2015; pp 185 - 190.
- C11** Fuentes-Garí M., **Misener R.**, Pefani E., García-Münzer D., Kostoglou M., Georgiadis M. C., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Cell cycle model selection for leukemia and its impact in chemotherapy outcomes. In Gernaey et al. (Eds), 12th International Symposium on Process Systems Engineering. Vol. 37 of *Computer-Aided Chemical Engineering*. Copenhagen, DK; 2015; pp 2159 - 2164
- C10** **Misener R.**, Allenby M. C., Fuentes-Garí M., Rende M., Velliou E., Panoskaltis 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.

- C09** Fuentes-Garí M., **Misener R.**, García-Münzer D., Velliou E., Panoskaltis 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.
- C08** Velliou E., Brito Dos Santos S., Fuentes-Garí M., **Misener R.**, Panoskaltis 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.
- C07** Velliou E., Fuentes-Garí M., **Misener R.**, Pefani E., Rende M., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. A framework for the design, modeling and optimization of biomedical systems. In Eden, Siirola, Towler (Ed.), *8th International Conference on Foundations of Computer-Aided Process Design*. Vol. 34 of *Computer-Aided Chemical Engineering*. Cle Elum, WA; 2014; pp 225 - 236.
- C06** **Misener R.**, Chin J., Lai M., Fuentes-Garí M., Velliou E., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Robust Superstructure Optimisation of a Bioreactor that Produces Red Blood Cells. In Klemeš, Varbanov, Liew (Ed.), *24th European Symposium on Computer Aided Process Engineering*. Vol. 33 of *Computer-Aided Chemical Engineering*. Budapest, Hungary; 2014; pp 91 - 96.
- C05** Skjäl A., Westerlund T., **Misener R.**, Floudas C. A. A Generalization of Classical α BB Underestimation to Include Bilinear Terms. In Bogle, Fairweather (Ed.), *22nd European Symposium on Computer Aided Process Engineering*. Vol. 30 of *Computer-Aided Chemical Engineering*. London, UK; 2012; pp 1202 - 1206.
- C04** **Misener R.**, Floudas C. A. Global Optimization of Large-Scale Extended and Generalized Pooling Problems: Mixed-Integer Nonlinearly Constrained Models. *Proceedings of the Toulouse Global Optimization Workshop*, Toulouse, FR; 2010; pp 89 - 92.
- C03** **Misener R.**, Gounaris C. E., Floudas C. A. Global Optimization and Parametric Analysis of Large-Scale Extended Pooling Problems. In Pierucci, Ferraris (Ed.), *20th European Symposium on Computer Aided Process Engineering*. Vol. 28 of *Computer-Aided Chemical Engineering*. Naples, IT; 2010; pp 847 - 852.
- C02** **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. *7th International Conference on Foundations of Computer-Aided Process Design*. Breckenridge, CO; 2009; pp 1053 - 1073.
- C01** **Misener R.**, Gounaris C. E., Floudas C. A. Multidimensional Piecewise-Affine Approximations for Gas Lifting and Pooling Applications. *7th International Conference on Foundations of Computer-Aided Process Design*. Breckenridge, CO; 2009; pp 887 - 896.

PUBLICATIONS WRITTEN FOR A GENERAL AUDIENCE

- GO2** **Misener R.** Christodoulos Achilleus Floudas. SIAG/OPT Views and News. **24**(1): 12 - 16, 2016.
- GO1** **Misener R.** Deterministic Global Optimisation at CPSE: Models, Algorithms, and Software. Centre for Process Systems Engineering Newsletter, Issue 10, 2014.

KEYNOTE / PLENARY PRESENTATIONS

UPCOMING

- K08** **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.
- 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.

PAST

K05 Misener R. Optimisation for Gradient Boosted Trees with Risk Control, *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

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

- 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 × 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**]

UPCOMING

- I20** Cecon F., **Misener R.** SUSPECT: MINLP Special Structure Detector for Python. *Optimization software, EURO*, Valencia, ES; Invited by Dr T Berthold; 07/2018.
- I19** 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.
- I18** 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.
- I17** 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.

PAST

- 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. *15th 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. *5th 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. *5th 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. *28th 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. *22nd 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. *4th International Conference on Continuous Optimization*, Lisbon, Portugal; Invited by Prof A Mitsos; 07/2013.

CONTRIBUTED CONFERENCE & WORKSHOP PRESENTATIONS [*PRESENTER]

- P39** Mistry M., **Misener R.*** Integrating Mixed-Integer Optimisation and Satisfiability Modulo Theories. *AIChE Annual Meeting*, Minneapolis, USA; 10/2017.
- 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 (out of 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., Panoskaltis 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., Panoskaltis 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., Panoskaltis 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.**, Panoskaltis 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., Panoskaltis 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.**, Panoskaltis 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., Panoskaltis 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., Panoskaltis 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., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. A framework for the design, modeling and optimization of biomedical systems. *8th International Conference on Foundations of Computer-Aided Process Design*. Cle Elum, WA; 07/2014.
- P19** **Misener R.***, Chin J., Lai M., Fuentes-Garí M., Velliou E., Panoskaltis 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., Panoskaltis 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 Partitioning 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.

POSTER PRESENTATIONS [***PRESENTER**]

O30 Letsios D., Kouyialis G.*, **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches. *UK/Ireland Annual Meeting of the Society for Industrial & Applied Mathematics*, Southampton, UK; 01/2018.

GK awarded 1st Poster Prize (there were two 1st prizes out of 34 entries)

O29 Aguirre A. M., Charitopoulos V. M., Diangelakis N. A., Letsios D.*, Oberdieck R., Silvente J., Dua V., **Misener R.**, Papageorgiou L. G., Parpas P., Pistikopoulos E. N., Wiesemann W. Uncertainty-Aware Planning & Scheduling in the Process Industries. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2017.

O28 Letsios D., Kouyialis G.*, **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches Problem in Heat Recovery Network Design. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2017.

GK awarded 2nd Poster Prize (out of 25 entries)

O27 Mistry M.*, Letsios D., **Misener R.**, Krennich G., Lee R. M. Optimisation with Gradient Boosted Trees and Risk Control. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2017.

O26 Olofsson S.*, Deisenroth M. P., **Misener R.** Design of Experiments for Model Discrimination using Gaussian Process Surrogate Models. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2017.

O25 Letsios D., Kouyialis G.*, **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. *Amazon Supply Chain Optimization Summit*. Seattle, WA; 10/2017.

O24 Letsios D., Kouyialis G.*, **Misener R.** Heuristics with Performance Guarantees for the Minimum Number of Matches in Heat Recovery Networks. *2nd PSE@ResearchDayUK*, Imperial, UK, 06/2017.

GK awarded 1st Poster Prize (out of 19 entries)

O23 Kouyialis G., **Misener R.** Detecting Symmetry in Designing Heat Exchanger Networks. *Foundations of Computer Aided Process Operations/Chemical Process Control*. Tucson, AZ; 2017.

GK awarded a FOCAPO/CPC 2017 Travel Grant to present this poster

O22 Allenby M. C., Tahlawi A., **Misener R.**, Brito dos Santos S., Mantalaris A., Panoskaltis N. Spatiotemporal Mapping of Erythroid, Stromal, and Osteogenic Niche Formation to Support Physiologic Red Cell Production in a 3-Dimensional Hollow Fibre Perfusion Bioreactor. *American Society of Hematology Annual Meeting*. San Diego, CA; 12/2016.

O21 Aguirre A. M., Charitopoulos V. M., Diangelakis N. A., Letsios D., Oberdieck R., Silvente J., Dua V., **Misener R.**, Papageorgiou L. G., Parpas P., Pistikopoulos E. N., Wiesemann W. Uncertainty-Aware Planning & Scheduling in the Process Industries. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2016.

O20 Mistry M., **Misener R.** Planning and Scheduling: Mixed Integer Programming Combined with Logical Methods. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2016.

O19 Kouyialis G., **Misener R.** Detecting Symmetry in Designing Heat Exchanger Networks. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2016.

O18 Baltean-Lugojan R., **Misener R.** Exploiting Sparse Topological Structure in Non-Convex Standard Pooling Problems. *Imperial Department of Computing PhD Google Poster Competition*. London, UK; 03/2016.

RBL awarded 2nd prize for 1st year PhD students

- O17** Kouyialis G., **Misener R.** Data Structures for Representing Symmetry in Quadratic Programs. *Centre for Process Systems Engineering Industrial Consortium Meeting*, Imperial, UK; 12/2015.
- O16** Fuentes-Garí M., Zemenides S., **Misener R.**, Georgiadis M. C., Pistikopoulos E. N., Mantalaris A., Panoskaltis 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. *American Society of Hematology Annual Meeting*. Orlando, FL; 12/2015.
- O15** Allenby M. C., Tahlawi A., Brito Dos Santos S., Hwang Y. S., **Misener R.**, Panoskaltis N., Mantalaris A. Development of an ex vivo bone marrow mimicry microenvironment in a novel 3D hollow fibre bioreactor. *International Symposium on Experimental Hematology*. Tokyo, JP; 09/2015.
- O14** **Misener R.**, Fuentes-Garí M., Allenby M. C., Pistikopoulos E. N., Panoskaltis N., Mantalaris A. Stem Cell Bio-Manufacturing Under Uncertainty: A Case Study in Optimising Red Blood Cell Production. *MEBioeng*. Leeds, UK; 09/2015.
- O13** Ulmasov D., **Misener R.**, Deisenroth M. P. Fast Bayesian Optimisation with Dimension Scheduling. *Network on Computational Statistics & Machine Learning Workshop*. Warwick, UK; 09/2015.
- O12** Fuentes-Garí M., **Misener R.**, Pefani E., García-Münzer D., Kostoglou M., Georgiadis M. C., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Cell cycle model selection for leukemia and its impact in chemotherapy outcomes. *12th International Symposium on Process Systems Engineering*. Copenhagen, DK; 06/2015.
- O11** Kouyialis G., **Misener R.** Exploiting Symmetry in Mixed Integer Non-Linear Optimisation. *Imperial Department of Computing PhD Google Poster Competition*. London, UK; 03/2015.
GK awarded 3rd prize for 1st year PhD students
- O10** Fuentes-Garí M., **Misener R.**, Kostoglou M., Georgiadis M. C., Pistikopoulos E. N., Panoskaltis N., Mantalaris A. Intelligent Optimisation of Personalised Chemotherapy for Leukaemia. *SET for Britain*. London, UK; 03/2015.
- O09** Savvopoulos S.*, **Misener R.**, Panoskaltis N., Pistikopoulos E. N., Mantalaris A. A Personalized Framework for Dynamic Modelling of Chronic Lymphocytic Leukemia Disease Trajectories. *AICHE Annual Meeting*. Atlanta, GA; 11/2014.
- O08** **Misener R.**, Allenby M. C., Fuentes-Garí M., Rende M., Velliou E., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Optimisation under uncertainty for a bioreactor that produces red blood cells. *TERMIS-EU*. Genova, IT; 06/2014.
- O07** Fuentes-Garí M., **Misener R.**, D. García-Münzer, Velliou E., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Development and experimental validation of cyclin-based population balance model of the cell cycle in leukaemia cell lines. *TERMIS-EU*. Genova, IT; 06/2014.
- O06** Velliou E., Brito Dos Santos S., Fuentes-Garí M., **Misener R.**, Panoskaltis 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. *TERMIS-EU*. Genova, IT; 06/2014.
- O05** **Misener R.**, Chin J., Lai M., Fuentes-Garí M., Rende M., Velliou E., Panoskaltis N., Pistikopoulos E. N., Mantalaris A. Optimising a Bioreactor that Produces Red Blood Cells under Uncertainty. *2nd Belgian Symposium on Tissue Engineering*, Leuven, BE; 10/2013. **Best Poster Award**
- O04** Velliou E., Fuentes-Garí M., Britos dos Santos S., **Misener R.**, Panoskaltis N., Mantalaris A., Pistikopoulos E. N. The effect of oxygen and glucose stress on the evolution of a leukaemia model system in an *in vitro* bone marrow biomimicry. *AICHE Annual Meeting*, San Francisco, CA; 11/2013.
- O03** **Misener R.** Towards Rational Chemotherapy Strategies: A Hybrid Computational / Experimental Approach. *Royal Academy of Engineering Annual Research Forum*, London, UK; 09/2013.
- O02** **Misener R.**, Gounaris C. E., Floudas C. A. Modeling and Globally Optimizing Large-Scale Pooling Problems with Environmental Constraints. *Graduate Student Symposium*, Princeton, NJ; 10/2009.

O01 Misener R., Gounaris C. E., Floudas C. A. Multidimensional Piecewise-Affine Approximations for Gas Lifting and Pooling Applications. *7th International Conference on Foundations of Computer-Aided Process Design*.

TEACHING

- Operations Research** Imperial
Course Leader Joint with Dr G Casale. Nominated for **2017 Best Teaching for Undergraduates** and finalist for **2018 Best Teaching for Postgraduates**. *Autumn 2016, 2017*
- 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. *Spring 2016, Autumn 2014, 2016, 2017*
- 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 ASSOCIATES

CURRENT

- Dr Dimitrios Letsios** 2016-
Contributing to the U Ψ^2 EPSRC project. Awarded: 2nd Presentation Prize, 2017 Department of Computing Research Associate Symposium
- Dr Kristijonas Cyras** 2017-
Contributing to the ROAD2H EPSRC project. Primary supervisor is Prof F Toni. I contribute to the optimisation side of Dr Cyras' work.
- Dr Juan Campos Salazar** 2018-
Contributing to the GALINI EPSRC project.

COMPLETED

- Dr Richard Oberdieck** 2015-16
Contributed to the U Ψ^2 EPSRC project. Primary supervisor was Prof E Pistikopoulos. *Now a Numerical Specialist at DONG Energy.*

RESEARCH MENTORING FOR PHD CANDIDATES

IMPERIAL DEPARTMENT OF COMPUTING

- Georgia Kouyialis** 2014-

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.

Radu Baltean-Lugoian

2015-

Multi-scale methods in large-scale pooling problems

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.

Miten Mistry

2015-

Funded by HiPEDs EPSRC Centre for Doctoral Training; Awarded 2015 Donald Davies Memorial Prize for MEng thesis excellence.

Simon Olofsson

2016-

Gaussian processes for hybridising analytical and data-driven optimisation: Application to bioreactors

Funded by ModLife (EU H2020 675251).

Francesco Ceccon

2016-

Johannes Wiebe Funded by Schlumberger & HiPEDs EPSRC Centre for Doctoral Training. 2017-

IMPERIAL DEPARTMENT OF CHEMICAL ENGINEERING _____

Symeon Savvopoulos

2013-18

Mathematical Modelling of Chronic Lymphocytic Leukaemia; Supervisors are Prof A Mantalaris and Prof E Pistikopoulos, our collaboration is on Modelling Disease Trajectories for CLL. *Now* a postdoctoral associate at KU Leuven with Prof S Kuhn.

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* a Senior Consultant at Process Systems Enterprise.

RESEARCH MENTORING FOR MASTERS & UG PROJECT STUDENTS

CURRENT _____

Bettina Alexieva

MSc, 2018

Julius Hense

Undergraduate project, 2017-18

Tasha Page

MSc, 2018

Michael Radigan

MEng, 2017-18

Sarah Wang

MSc, 2018

Shudian Zhao

MSc, 2018

COMPLETED _____

Habib Adebisi Abubakar

MSc, 2013-14

Managing Disparate Numerical Scales in Global Optimisation; joint with Prof C Adjiman.

Nikolaos Stefanopoulos

MSc, 2013-14

Linking Experimental & Computational Models of Chronic Lymphocytic Leukaemia; joint with Prof A Mantalaris and Prof E Pistikopoulos.

Miten Mistry

MEng, 2014-15

Increasing Energy Efficiency in Industrial Plants: Optimising Heat Exchanger Networks. Thesis published in *Computers & Chemical Engineering* (J25).

MM awarded 2015 Donald Davies Memorial Prize for MEng thesis excellence

Balarabe Ogbeha

BEng, 2014-15

Detecting Symmetry in Mixed-Integer Nonlinear Optimisation

Francesco Ceccon

MSc, 2015

Optimising Energy Systems: Deducing Network Topology. Thesis published in *AIChE Journal* (J26).

Jiaying Li MSc, 2015
Detecting Symmetry in Mixed-Integer Nonlinear Optimisation

Doniyor Ulmasov MSc, 2015
Bayesian Framework for Microalgae Optimisation; joint with Dr M P Deisenroth. Collaboration with Dr B Chachuat and Dr C Baroukh. Thesis published at *ESCAPE* (C17).

Chia (Joel) Choo MRes Project, 2015
Solving the QAP using Quantum Computing; joint with Dr L Nardi and Prof P Kelly.

Melinda Chan MSc, 2016
Vehicle Routing Problem with Time Windows

Karlson Lee MSc, 2016
Mixed integer optimisation for interplanetary space travel; joint with Dr A Faisal.

Pierre Thary MSc, 2016
Solving analytical optimisation problems with black-box functions embedded

Chase Hellemans MEng, 2016-17
Learning Optimal Bayesian Networks from Data

Jakub Grzegorek MEng, 2016-17
Solving Vehicle Routing Problem with Genetic Algorithms

Pingchuan Ma MSc Independent Study Option, 2017
Mixed Integer Nonlinear Optimisation

Christian Wesselhoeft MSc Independent Study Option & MSc thesis, 2017
Mixed-integer PDE-constrained optimisation; joint with Dr D Ham. Thesis published at *PSE* (C22).
CW awarded 2017 Winton Capital Applied Computing MSc Project Prize

Anna Collins Undergraduate Research Opportunities Programme, 2017
Optimisation & Argumentation for Personalised Health Care; joint with Prof F Toni.

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

DOCTORAL THESIS COMMITTEES

| | | |
|---|---------------------------|---------|
| Styliani Avraamidou <i>Mixed-Integer Multi-level Optimization through Multi-Parametric Programming</i> | Imperial | 02/2018 |
| Ahmadreza Marandi <i>Aspects of Quadratic Optimization: Nonconvexity, Uncertainty, and Applications</i> | University of Tilburg | 12/2017 |
| Juan Campos Salazar <i>A multigrid approach to SDP relaxations of sparse polynomial optimization problems</i> | Imperial | 11/2017 |
| Fabian Rigterink <i>Pooling Problems: Advances in Theory and Applications</i> | University of Newcastle | 05/2017 |
| Nikos Diangelakis <i>Model-based multi-parametric programming strategies towards the integration of design, control and operational optimization</i> | Imperial | 03/2017 |
| Carlos Perez Galvan <i>Global Optimisation for Dynamic Systems using Novel Overestimation Reduction Techniques</i> | University College London | 02/2017 |
| Tiberiu Chis <i>Performance modelling with adaptive hidden Markov models and discriminatory process sharing queues</i> | Imperial | 04/2016 |
| Ioana Nascu <i>Advanced multiparametric optimization and control studies for anaesthesia</i> | Imperial | 04/2016 |

FINANCIAL SUPPORT SECURED

FELLOWSHIPS

Engineering & Physical Sciences Research Council Early Career Fellowship 2017 - 2022
 Title: *GALINI: Global ALgorithms for mixed-Integer Nonlinear optimisation of Industrial systems*

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|--|-------------|
| Priority area: Software development for novel engineering research; Includes 6 years postdoc funding | |
| Royal Academy of Engineering Research Fellowship | 2012 - 2017 |
| Support for engineers to develop an academic research career | |
| Imperial College Junior Research Fellowship | 2012 - 2015 |
| Sustain early career researchers (declined) | |
| USA National Science Foundation Graduate Research Fellowship | 2007 - 2012 |
| Support for graduate students in STEM | |
| Princeton University Gordon Y. S. Wu Fellowship | 2007 - 2009 |

GRANTS

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|--|-------------|
| BASF Research Project | 2017 |
| Research of interest to BASF (PI). To RM: 4.2 months PhD funding. | |
| ROAD2H: Resource Optimisation, Argumentation, Decision Support and 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. | |
| Prognosis for Fault Diagnosis | 2017 - 2021 |
| EPSRC Industrial CASE Studentship from Schlumberger (PI). To RM: 3.5 years PhD funding. | |
| Parallelising Mixed-Integer Optimisation: Energy Efficiency Applications | 2017 - 2018 |
| EPSRC First Grant Scheme (PI). To RM: 1 year Research Associate Funding, 3 hours per week. | |
| 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 | |
| SyMBioSys: Systematic Models for Biological Systems Engineering | 2015 - 2019 |
| EU H2020 675585. Investigators: Prof A Mantalaris (PI), Dr R Misener (coI), Dr N Panoskaltis, European Commission (H2020-MSCA-ITN-2015); To RM: 5 hours per week | |
| UΨ²: 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 Pappas (Imperial PI), Dr E Pistikopoulos, Dr W Wiesemann, EPSRC; To RM: 3.5 years RA funding & 3.8 hours per week | |

TRAVEL GRANTS

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|---|---------|-------------|
| European Science Foundation Travel Grant | € 500; | 2013 |
| <i>2nd Belgian Symposium on Tissue Engineering</i> | | |
| Princeton University Deans Fund for Scholarly Travel | \$ 600; | 2012 |
| Princeton University Wu Travel Fund Award | \$1000; | 2009 |
| CACHE Corporation National Science Foundation Travel Grant | \$1000; | 2009; 2014 |
| Princeton University Walter R. Schowalter Travel Fund Award | \$2000; | 2008 - 2012 |

PROFESSIONAL SERVICE

LEADERSHIP IN MY RESEARCH COMMUNITY

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|---|-------------|
| Director of the AIChE Computing and Systems Technology Division | 2016 - 2018 |
| <i>This is an elected post which several people hold simultaneously. In my tenure thus far, I have overhauled the CAST Student Travel Award, created an online Poster Kiosk to increase poster session prestige, & initiated the Software Tools & Implementations session at the AIChE meeting.</i> | |
| Management Committee Member, EU COST Action TD1207 | 2016 - 2017 |
| <i>Mathematical Optimization for Efficient & Robust Energy Networks</i> | |

PROGRAM COMMITTEE MEMBERSHIPS

| | |
|--|----------|
| Mixed-Integer Programming Workshop | MIP 2018 |
| Process Systems Engineering | PSE 2018 |
| Co-chair of the PSE 2018 <i>Optimization Methods & Computational Tools</i> theme | |

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|---|---------------------------------|
| EUROPT Workshop on Advances in Continuous Optimization Computational Management Science | EUROPT 2017, 18 CMS 2017 |
| European Symposium on Computer Aided Process Engineering 6 th INFORMS Optimization Society Conference | ESCAPE 2016, 17, 18 IOS 2016 |

CONFERENCE & SEMINAR ORGANISATION

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|---|------------|
| Dagstuhl Seminar on <i>Algorithms for Mixed-Integer Nonlinear Optimization</i> (18081) Joint with Dr P Bonami, Dr A Gleixner, Prof J Linderoth | 2018 |
| Organise the Imperial Centre for Process Systems Engineering Seminar Series | 2015; 2016 |
| Organising Committee: 17 th British-French-German Conference on Optimisation | 2015 |

SESSIONS CHAIRED AT MAJOR INTERNATIONAL CONFERENCES

| | |
|---|-------------------------|
| 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 |

PARTICIPATION IN INVITED WORKSHOPS

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|---|------------|
| Amazon Supply Chain Optimization Summit | 09/10/2017 |
| EPSRC Operational Research Theme Day | 15/09/2015 |

DEPARTMENTAL & COLLEGE SERVICE

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|---|--------|
| <i>Member</i> , Departmental Management Committee | 2016 - |
| <i>Member</i> , Energy Futures Laboratory Technical Working Group | 2017 - |
| <i>Member</i> , Department of Computing Equality, Diversity & Education Committee | 2017 - |

EDITORIAL WORK & PEER REVIEW

| | |
|--|--------|
| <i>Associate Editor</i> , Optimization and Engineering | 2017 - |
| <i>Editorial Board</i> , Mathematical Programming B | 2018 - |
| <i>Member</i> , EPSRC Peer Review College (Associate Member, 2017-2018; Full Member 2018-) | |
| <i>Reviewer</i> , 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, Journal of Global Optimization, Journal of Optimization Theory & Applications, Management Science, Mathematical Programming, Operations Research, Operations Research Letters, Optimization Letters, SIAM Journal on Optimization | |

COMMUNITY OUTREACH & SERVICE

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|---|----------|
| 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 1 st 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-facilitator and program participant at MIT LeaderShape | 2006 - 2007 |

AFFILIATIONS

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|---|----------------|
| <i>Senior Member</i> , American Institute of Chemical Engineers | AIChE 2008 - |
| <i>Member</i> , British Computer Society | BCS 2017 - |
| <i>Member</i> , Centre for Process Systems Engineering | CPSE 2014 - |
| I am CPSE "Friend" to ExxonMobil, i.e. I enable CPSE/XOM connections | |
| <i>Member</i> , Institute for Operations Research & Management Sciences | INFORMS 2014 - |
| <i>Member</i> , Mathematical Optimization Society | MOS 2014 - |
| <i>Member</i> , Tau Beta Pi – Engineering Honor Society | TBP 2007 - |
| The top 20% of MIT Engineering Undergraduates are eligible for TBP | |