Dr Dante Kalise

Senior Lecturer in Computational Optimisation and Control
Updated: March 28, 2023

Research Areas: Scientific Computing, Optimization & Control

FOUNDATIONS. Dynamic optimization with ODE/PDE constraints; mathematical control theory; high-dimensional approximation and learning; numerical methods for Hamilton-Jacobi PDEs; optimal transport, mean-field control/games.

APPLICATIONS. Scientific Machine Learning; data-driven control design. Agent-based models: nonlocal PDES, collective behaviour, consensus control. Nonlinear control design: power electronics, swarm robotics. Control of PDEs: fluid flow and vibration control, optimal actuator design.

Appointments

Senior Lecturer	Department of Mathematics, AMMP Section Imperial College London, United Kingdom	7/2021–
Other affiliations at Imperial	Data Science Institute Artificial Intelligence Network	
Assistant Professor	School of Mathematical Sciences University of Nottingham, United Kingdom	6/2019–6/2021
Academic Fellow	Data Science Institute Imperial College London, United Kingdom	4/2018–
ICL Research Fellow	Department of Mathematics Imperial College London, United Kingdom	9/2017–5/2019
Research Scientist	Optimization and Optimal Control Group RICAM, Linz, Austria	5/2013–8/2017
Postdoctoral Researcher with Secondment	Sapienza University of Rome, Italy University of Bayreuth, Germany	11/2011–10/2012 11/2012–4/2013
Ph.D. Researcher	Research and Development Department Storm Weather Center, Norway	8/2008–10/2011
Lecturer	Department of Mathematics Federico Santa María University, Chile	3/2007–7/2008

Education and Relevant Qualifications

PhD	Mathematics	University of Bergen, Norway	6/2012
MSc	Electronic Engineering	Federico Santa María University, Chile	7/2008
BSc	Engineering Mathematics	Federico Santa María University, Chile	12/2006

Additional Qualifications

- 11/2020: attained Fellow status from Advance HE after completing 40 credits of PGCHE.

- 8/2018: obtained the National Scientific Habilitation in Numerical Analysis from the Italian Ministry of Education.

Awards

- 2022 Times Higher Education Award for Best STEM Research Project.
- ICIAM 2019 Travel Award, QJMAM Travel Grant.
- ITN-SADCO Postdoctoral Grant, European Union 7th Framework Programme (2011–2013).
- Bicentenary Ph.D. Fellowship, Chilean Ministry of Education (2009–2011).
- Full M.Sc. Scholarship, Federico Santa María University (2007–2008).
- Dean's List, Federico Santa María University (2004–2007).
- Academic Merit Award, Federico Santa María University (2004–2007).
- Starr Foundation Full Scholarship (2003–2007).
- Highest National Score in Mathematics, Entrance Exams to Chilean Universities (2002).

Funded Research Projects

- PI, Imperial-CNRS Fund, Project: Towards A Quantitative Mean Field Game Framework for Pedestrian Dynamic, 10/2021–10/2023.
- CoI, EPSRC New Horizons Award, Project: Overcoming the Curse of Dimensionality with Tensor Decompositions, 3/2021–3/2024.
- CoI, EPSRC Grant, Project: Elastic Manufacturing Systems, 9/2020–9/2024.
- CoI, UKRI-EPSRC COVID-19 Fund, Project: Optimal Lockdown, 8/2020–2/2022.
- PI, Gaspard Monge Program for Optimization, Operations Research and Data Science, Project TIDAL: Taming the Curse of Dimensionality in Dynamic Programming Equations, 7/2019–7/2021.
- PI, Imperial College Research Fellowship: Multiscale optimal control of collective behaviour phenomena, 9/2017–5/2019.
- PI, Ser Cymru II Fellowship: Advanced computational methods for optimal feedback control with applications in engineering and life sciences. funded by Welsh-European Funding Office .Awarded in 2017 and declined for Imperial College Research Fellowship.

Participation in Research Projects

- Research Scientist, ERC-Advanced Grant OCLOC: From Open to Closed Loop Optimal Control of PDEs, PI: Karl Kunisch, 3/2016–7/2017.
- Research Scientist, START Project: Sparse Approximation and Optimization in High Dimensions, funded by the Austrian Research Fund (FWF), PI: Massimo Fornasier, 4/2009–6/2015.
- Experienced Researcher, Initial Training Network SADCO: Sensitivity Analysis for Deterministic Controller Design, funded by the European Union FP7, 1/2011–12/2014.
- Research Scientist, eVITA-EnKF Network: Forecasting non-linear systems using the ensemble Kalman filter and related methods, funded by the Research Council of Norway, 9/2007–9/2011.

Undergraduate Teaching Experience

- Department of Mathematics, Imperial College London, UK   Since 2022 –
  Lecturer and module designer, Optimisation.
- School of Mathematical Sciences, University of Nottingham, UK   Autumn 2020
  Lecturer, Optimisation.
- School of Mathematical Sciences, University of Nottingham, UK   Spring 2020
  Lecturer, Computerised Mathematical Methods in Engineering.
- Department of Computer Science, University of Verona, Italy   November 18–20, 2019
  Lecturer, UG/PG short course: Optimisation and Control of Agent-based Dynamics.
- University of Applied Sciences of Upper Austria, Wels   November 2016 – February 2017
  Substitute Lecturer, Applied Mathematics I.
- Federico Santa María Technical University, Valparaíso, Chile   March 2007 – July 2008
  Lecturer, Department of Mathematics, semester courses: Calculus, Differential Equations, and Multivariate Calculus, for first and second year engineering students.

Graduate Teaching Experience

- Department of Computer Science, University of Verona, Italy   December 2022
  Lecturer, short graduate course: Data-driven Optimal Control.
- MAGIC Mathematics Taught Course Centre, UK   Autumn 2020
  Lecturer and course designer, graduate course: Optimal Control and Reinforcement Learning.
- Department of Computer Science, University of Verona, Italy   June 2020
  Lecturer, short graduate course: Mathematical Foundations of Reinforcement Learning.
- Department of Computer Science, University of Verona, Italy   November 26–30, 2018
  Lecturer, short graduate course: Optimal Control of Multiscale Agent-Based Models.
- Department of Mathematics, Imperial College London   October-December, 2018
  Lecturer and designer, graduate course: Mathematical Foundations of Reinforcement Learning.
- Max Ent Workshop, The Alan Turing Institute, London, UK   July 2–6, 2018
  Lecturer, Tutorial on Mean Field Games
- SADCO-WIAS Young Researcher's Workshop, WIAS, Berlin, Germany   January 29–31, 2014
  Lecturer, Tutorial on Essentials of Reduced Order Modelling for Control Design
- Chair of Applied Mathematics, University of Bayreuth, Germany   February 2013
  Lecturer, short course: Optimal Control of Infinite-Dimensional Dynamical Systems
- Department of Mathematics, La Sapienza University of Rome, Italy   May 2012
  Lecturer, short course: Optimal Control of Infinite-Dimensional Dynamical Systems

Research Supervision

Postdoctoral Researchers

- Luca Saluzzi, Postdoctoral research associate (Bath/Imperial, CoS: Sergey Dolgov)   05/21-03/23
  Project: EPSRC New Horizons Award *Tensor Decomposition Methods for High-dimensional Dynamic Programming Equations.*
- Domènec Ruiz-Balet, Postdoctoral research associate (Imperial)   12/21-11/24
  Project: EPSRC Grant *Elastic Manufacturing Systems.*

PhD Students

- Matías Gómez, Mathematics (Imperial), main supervisor. 1/2023–
  Thesis: Topics at the intersection between Control, Deep Learning, and Optimal Transport.

- Carlos Doebeli, Mathematics (Imperial), main supervisor, Co-S: Colin Cotter. 10/2022–
  Thesis: Controlling swarm robotics with optimal transport.

- Yuyang Huang, Mathematics (Imperial), main supervisor, Co-S: Nikolas Kantas. 10/2022–
  Thesis: Stochastic optimization algorithms for physics-informed neural networks.

- Luca Marino, Mathematics (ICL/Oxford CDT MRS), main supervisor. 10/2022–
  Thesis: Data-driven solvers for second-order Hamilton-Jacobi-Bellman PDEs.

- Sattam Alrashidy, Mathematics (Nottingham), co-supervised with Kris van der Zee. 12/2021–
  Thesis: Optimization, Control and Estimation for Nonlinear PDEs in Transport Phenomena.

- Sara Bicego, (Mathematics), Imperial, main supervisor, Co-S: Nikolas Kantas. 10/2021–
  Thesis: Deep Learning Methods for Hamilton-Jacobi-Bellman PDEs and Applications.

- Hamd Alsobhi, Mathematics (Nottingham), co-supervised with Kris van der Zee. 12/2020–
  Thesis: Minimal-residual Methods and Optimization.

- Cathie Wells, Mathematics (ICL/Reading MPE CDT), joint supervision with Paul Williams and Nancy Nichols.
  Thesis: Reformulating aircraft routing algorithms to reduce fuel burn and thus CO2 emissions.
  10/2020: Ivar Isaksen Prize at the 3rd ECATS Conference.
  1/2022: Take Aim Award 2021 for Scientific Communication.
  8/2022: THE Award for Best STEM Research Project
  Thesis submitted in 9/2022, awaiting for Viva date.

MSc/MMath Students

- Sandra Lefdal MSc Applied Mathematics (Imperial) ongoing
  Project: Identifying Interaction Potentials in Collective Animal Behavior.

- Jorge Catarecha Otero Saavedra MSc Applied Mathematics (Imperial) ongoing
  Project: Deep Learning for Optimal Trajectory Planning.

- Josefa Stoisser, MMath (ETH Zürich, Switzerlandl) ongoing
  Project: Optimal Trajectory Planning.

- Yining Zhu MMath (Imperial) ongoing
  Project: Sparse Optimization for Nonlinear PDEs.

- Lucas Machado, MSc Applied Mathematics (Fundação Getulio Vargas, Brazil) 2022
  Project: Optimal Control of the Fokker-Planck Equation.
  Lucas is visiting MSc student during Fall 2022.

- Amaury Francou, MSc Applied Mathematics (Imperial) 2022
  Project: Deep Learning for Optimal Trajectory Planning.

- Andreas Sialis, MSc Applied Mathematics (Imperial) 2022
  Project: Optimal Control of Structural Vibration Phenomena.

- Christian Hines, MSc Applied Mathematics (Imperial) 2022
  Project: Data-driven Discovery of Collective Animal Behaviour.

- Lucjano Muhametaj, MSc Applied Mathematics (Imperial, CoS: Greg Pavliotis) 2022
  Project: Time-optimal Control of Agent-based Dynamics.

- Frederik Kelbel, MSc Applied Mathematics (Imperial, CoS: Greg Pavliotis) 2021
  Project: Controlling Agent-based Dynamics with a Deep Galerkin Feedback Law.

- Sara Bicego, MSc Mathematics (Verona, CoS: Giacomo Albi) 2021
  Project: Deep Learning for State-Dependent Riccati Equations.

- Gil Segev, MSc Mathematics (Nottingham)   2021
  Project: Deep Learning Algorithms for Optimal Feedback Laws.

- Harry North, MSc Mathematics (Nottingham)   2021
  Project: Physics-informed Neural Networks for the Eikonal Equation.

- Bradley Jackson, MSc Financial Computational Mathematics (Nottingham)   2020
  Project: Clustering Algorithms for Financial Risk Analysis.

- Denis Ogurtsov, MSc Financial Computational Mathematics (Nottingham)   2020
  Project: Agent-based Models for Volatility Clustering.

- Isaac Oldwood, MSc Statistics (Nottingham)   2020
  Project: A Statistical Machine Learning Framework for High Dimensional PDEs.

- Steven Kuijpers, MSc Applied Mathematics (Imperial, CoS: José A. Carrillo)   2019
  Project: Computational Methods for Optimal Transport.

- Maxence de Rochechouart, MSc Applied Mathematics (Imperial, CoS: Matías Delgadino)   2019
  Project: A Machine Learning Approach to the Numerical Approximation of PDEs.

- Jin Lee, MSc Applied Mathematics (Imperial, CoS: Diego Oyarzún)   2018
  Project: Identification of Basis of Attraction with Zubov's Method.

- Marco Casas, MSc Applied Mathematics (Imperial, CoS: José A. Carrillo)   2018
  Project: Optimal Cooperative Strategies in Multi-agent Systems.

Undergraduate Research Projects

- Jaemo Shi, BSc Mathematics (Imperial)   7-8/2022
  Undergraduate Research Experience (Imperial): Machine Learning for Collective Behaviour.

- Tim Wang, BSc Mathematics (Imperial)   7-8/2022
  Undergraduate Research Experience (Imperial): Machine Learning for Collective Behaviour.

- Siddharth Pullabhatla, BSc Mathematics (Imperial)   Spring 2022
  M3R (Imperial): Convex and Global Optimization methods for Deep Learning.

- Zeqi Wang, BSc Mathematics (University of Nottingham)   7-8/2021
  Undergraduate Research Experience (Imperial): Machine Learning for Collective Behaviour.

- Leonardo Mutti, BSc Engineering Mathematics (Politecnico di Milano)   9/2018
  Undergraduate Research Experience (Imperial): Modelling and Control of Social Dynamics.

Research activities

Recent talks and conferences (2019 onwards, *= invited talks)

- * Numerical Methods for Optimal Transport Problems and Mean Field Games, UTFSM, CL, 1/24.

- * Control Methods in Hyperbolic Partial Differential Equations, Oberwolfach, DE, 11/23.

- 6th European Conference on Computational Optimization, Heidelberg, 9/23.

- * International Congress on Industrial and Applied Mathematics, Tokyo, JP, 8/23.

- * SIAM Conference on Control and its Applications, Philadelphia, US, 7/23.

- * Numerical Methods for Mean Field Games and Related Problems, UCL, UK, 7/23.

- * Numerical Aspects of Hyperbolic Balance Laws and Related Problems, Cortona, IT, 6/23.

- * Nonlinear Partial Differential Equations, Sapienza University of Rome, IT, 5/23.

- * Third AFOSR-Monterey Workshop on Computational Issues in Nonlinear Control, US, 5/23.

- * Applied and Computational Analysis Seminar, University of Cambridge, UK, 5/23.

- British Applied Mathematics Colloquium, University of Bristol, UK, 4/23.
- * Center for Mathematics and Artificial Intelligence Colloquium, online, 3/23.
- * 20 Years of the Johann Radon Institute (RICAM), Linz, AT, 3/23.
- * Deep-dive session on Optimal Control and Inference, Isaac Newton Institute, UK, 2/23.
- Oden Institute Seminar, US, 2/23.
- * Chengdu Winter School on Numerical Methods for Evolution PDEs, online, 12/22.
- * Kinetic Equations: Recent Developments and Novel Applications, BIRS-CMO, MX, 11/22.
- * Workshop on Mathematical Modelling and Scientific Computing, TU Munich, DE, 10/22.
- * Mathematical Data Science, Control and Optimization, KFU Graz, AT, 9/22.
- * Mathematical Theory of Networks and Systems MTNS22, Bayreuth, DE, 9/22 (semi-plenary).
- * Machine Learning for PDEs Workshop, London School of Economics, UK, 8/22.
- * Applied Algebra and Geometry UK Network Meeting, Swansea University, UK, 8/22.
- * Engineering Mathematics National Meeting, Catholic University of Chile, CL, 8/22 (plenary).
- * SciCADE22 Scientific Computation and Differential Equations, University of Iceland, IS, 7/22.
- * Machine Learning for Optimal Control Workshop, Imperial College London, UK, 7/22.
- * Theory and numerics of Mean Field Games and Hamilton-Jacobi equations, Rome, IT, 6/22.
- * From Individual to Collective Behaviour in Biological and Robotic Systems, ICMS, UK, 6/22.
- * French Society for Industrial and Applied Mathematics Conference, Limoges, FR, 5/22.
- * SIAM Conference on Analysis of Partial Differential Equations, TU Berlin, DE, 3/22.
- Numerical Analysis Seminar, The University of Hong Kong, HK, 3/22.
- * 60th IEEE Conference on Decision and Control, Austin, US, 12/21.
- Deep Learning and Partial Differential Equations, INI Cambridge, UK, 11/21.
- * Ghana Numerical Analysis Seminar, University of Cape Coast, GH, 7/21.
- * SIAM Conference on Control and Its Applications, Spokane, US, 7/21.
- * Mini-Workshop: Analysis of Data-driven Optimal Control, Oberwolfach, DE, 5/21.
- * Numerical Analysis Seminar, University of Bath, UK, 3/21.
- * Third Multidisciplinary Workshop in Science and Engineering, UTEM, CL, 1/21.
- * DMV Annual Meeting, Chemnitz, DE, 9/20.
- Seminario di Modellistica Differenziale Numerica, Sapienza University of Rome, IT, 7/20.
- * Workshop on PDE-constrained Optimization, University of Edinburgh, UK, 5/20.
- Applied and Computational Mathematics Seminar, University of Edinburgh, UK, 1/20.
- PGMO Days, EDF'Lab Palaiseau, FR, 12/19.
- Special Semester on Optimization, RICAM Linz, AT, 10-12/19.
- * Optimal Control & Mean Field Games, EMAp/FGV, Rio de Janeiro, BR, 9/19.
- * Computational Issues in Nonlinear Control, Naval Postgraduate School, Monterey, US, 9/19.
- * 6th International Conference on Continuous Optimization, TU Berlin, DE, 8/19.
- * International Congress on Industrial and Applied Mathematics, Valencia, ES, 7/19.
- 28th UK Numerical Analysis Conference, University of Strathclyde, UK, 6/19.
- * British Applied Mathematics Colloquium, University of Bath, UK, 4/19.
- Mean-field games, Energy Systems, and Other Applications, ICMS Edinburgh, UK, 4/19.
- * Control Theory and Applications, Gran Sasso Science Institute L'Aquila, IT, 3/19.
- 90th GAMM Annual Meeting, TU Vienna, AT, 2/19.
- Scientific Machine Learning, ICERM Brown, US, 1/19.

RESEARCH VISITS

- Isaac Newton Institute, University of Cambridge, UK (2/2022, 2/2023).
- Mathematical Institute, University of Oxford, UK (11/2022).
- Laboratoire de Physique Théorique et Modèles Statistiques, Orsay, FR (5/2022).
- School of Mathematics, University of Edinburgh, UK (2/2020).
- Mittag-Leffler Institute, Djursholm, SE (10/2018).
- MFO, Oberwolfach Research Institute for Mathematics, DE (4/2018).
- Department of Mathematics, University of Graz, AT (2/2018, 5/2018).
- Warwick Mathematics Institute, University of Warwick, US (11/2017).
- Laboratoire Jacques-Louis Lions, Paris VI University, FR (11/2017, 4/2018).
- Department of Mathematics, Cornell University, US (5/2017).
- Department of Applied Mathematics, University of Waterloo, CA (4/2017).
- Institute for Geometry and Applied Mathematics, RWTH Aachen University, DE (9/2016).
- Department of Mathematics, Swansea University, UK (8/2016).
- Faculty of Mathematics, Technical University of Munich, DE (7/2016).
- Institute for Mathematics and Scientific Computing, University of Graz, AT (5/2016).
- Chair of Applied Mathematics , University of Bayreuth, DE (7/2015).
- Department of Mathematics and Computer Sciences, University of Limoges, FR (5/2015).
- Department of Mathematics, University of Hamburg, DE (11/2014).
- Department of Mathematics, University of Konstanz, DE (9/2014).
- Chilean Nuclear Energy Commission, Santiago, CL (7/2014).
- Leibniz Institute for Tropospheric Research, Leipzig, DE (12/2012).
- Department of Applied Mathematics, ENSTA Paristech, Paris, FR (10/2012).
- Centre of Mathematics for Applications, University of Oslo, NO, 8/2009–8/2011.
- Laboratory of Applied Mathematics, University of Trento, IT, 5/2010–10/2010.
- Center for Scientific Studies, Valdivia, CL, 1/2007–2/2007.

OTHER PROFESSIONAL ACTIVITIES

EDITORIAL DUTIES

- Since 7/2021, Associate Editor of Advances in Discrete and Continuous Models (Springer), Control section.
- Since 12/2019, Associate Editor of Mathematics of Control, Signals, and Systems (Springer). Co-editor of 2 special issues: "Machine Learning for Control Systems and Optimal Control" and "Optimal Control and Dynamic Games: Large Time Behavior and Geometry".

LEADERSHIP AND MANAGEMENT ROLES

- Since 2022, EDI Committee member, Department of Mathematics (Imperial).
- Since 2021, Admissions reviewer for the MSc in Applied Mathematics (Imperial).
- Since 2021, Learning, Computation, and Control Seminar organizer (Imperial).
- Since 2021, Various committees (I-X, PhD reviews, Chapman Fellowships) at Imperial.
- 2020-2021: Course Director for the Machine Learning in Science MSc (University of Nottingham).
- 2019-2021: Scientific Computation Seminar organizer (University of Nottingham).

2022 The research project of my PhD student Cathie Wells (Imperial/Reading MPE CDT) has been covered in different media, and has won the Times Higher Education Awards 2022 for Best STEM Research Project.

2021 Our paper *A Mobility-Based Approach to Optimize Pandemic Lockdown Strategies* has been featured in PLOS Computational Biology, see the press release here.

2021 Speaker at "Skype a Scientist" events, delivering online talks to primary schools around the world.

2021 Speaker the outreach online event "insight4me Mathematics: Mathematical Modelling", with the talk "Mathematical Optimization: the best of all possible worlds".

2021 Our paper *Reducing transatlantic flight emissions by fuel-optimised routing* has been reported by over 30 news outlets around the world (see media stats here), and has been discussed by NATS, the main traffic controller in the United Kingdom.

2020 Speaker at "Ciencias para la Innovación" (Science for Innovation) Event, Sub-Antartic Consortium of Chilean Universities, Ciencia 2030 Programme.

2018 Mathematics Speaker, Open Days at Imperial College London.

2018 Participant at Science in Parliament - STEM for Britain: `https://stemforbritain.org.uk/`.

2016 An article by the Austrian Press Agency about my research on a computational approach for the control of social dynamics and collective behavior is available here.

2016 The paper *Invisible control of self-organizing agents leaving unknown environments* has received considerable attention by the media: six popular science magazines including the Italian version of Scientific American Italian version of Scientific American highlighting our research in agent-based modelling of social dynamics.

2014 Within the workshop *Geometric control and related fields* (November 17-21, 2014 at RICAM), I co-organized the public lecture *Historical chronology: Truth or fable?*, which attracted a diverse audience interested on the links between Mathematics, Celestial Mechanics, and Historical Chronology. More details can be found at RICAM's website.

2014 I gave the public talk *High-resolution numerical methods and applications in Optimization and Control* at the Science/Technology Interaction Cycle of the Chilean Nuclear Energy Commission, raising awareness within nuclear research practitioners on the use of state of the art computational methods.

2012 My PhD in computational methods for atmospheric modelling was developed in co-supervision with the R&D Department of StormGeo AS (`www.stormgeo.com`), a leading weather forecast company in Scandinavia. During this period I participated in the formulation of tender bid proposals for high-resolution wind forecast systems for wind farms in South America.

Organization of scientific meetings

- Co-organizer of the session *Optimization and Applications* at the 6th European Conference on Computational Optimization, September 25–27 2023, Heidelberg, Germany.

- Co-organizer of the minisymposium *Modern Numerical Methods for PDE-constrained Optimization and Control* at the International Congress of Industrial and Applied Mathematics ICIAM, August 20–25 2023, Tokyo, Japan.

- Co-organizer of the minisymposium *Optimisation and Control of Nonlinear Dynamics* at the British Applied Mathematics Colloquium, UWE Bristol, April 3–5, 2023.

- Member of the Programme Committee, 25th International Symposium on Mathematical Theory of Networks and Systems MTNS2022, Bayreuth, DE.

- Co-organizer of the workshop *Feedback Control of PDEs*, November 2019, RICAM, Linz, Austria.

- Co-organizer of the minisymposium *Novel Concepts in Model-driven Optimization and Control of Agent-based Systems* at the International Congress of Industrial and Applied Mathematics ICIAM, July 15–19 2019, Valencia, Spain.

- Co-organizer of the minisymposium *Computation methods for model-driven optimization and control under uncertainty* at the 28th Biennial Numerical Analysis Conference, June 25–28 2019, University of Strathclyde, Glasgow, United Kingdom.

- Co-organizer of the minisymposium *Numerical Methods for PDE-Constrained Optimization* at the 27th Biennial Numerical Analysis Conference, June 27–30 2017, University of Strathclyde, Glasgow, United Kingdom.

- Co-organizer of the minisymposium *Numerical Approximation and Optimization of Agent-based Models* at the 27th Biennial Numerical Analysis Conference, June 27–30 2017, University of Strathclyde, Glasgow, United Kingdom.

- Co-organizer of the workshop *Numerical methods for Hamilton-Jacobi equations in optimal control and related fields*, November 21–25 2016, RICAM, Linz, Austria.

- Co-organizer of the minisymposium *Recent developments in numerical methods for Hamilton-Jacobi-Bellman equations and multi-agent systems*, at the 5th Workshop on Numerical Analysis of Partial Differential Equations, January 11–15 2016, University of Concepción, Chile.

- Member of the Organizing Committee of the *Workshop on Optimal Control of Partial and Ordinary Differential Equations*, November 16–17 2015, École Polytechnique, Palaiseau, France.

- Co-organizer of the minisymposium *Optimal control and Hamilton-Jacobi-Bellman equations*, at the 27th IFIP TC7 Conference, June 29–July 3 2015, Sophia-Antipolis, France.

- Co-organizer of the minisymposium *Modelling and Control of Multi-agent Systems*, at the 27th IFIP TC7 Conference, June 29th–July 3rd 2015, Sophia-Antipolis, France.

- Organizer of the minisymposium *Numerical methods for feedback control of dynamical systems and related topics* at the 26th Biennial Numerical Analysis Conference, June 23–26 2015, University of Strathclyde, Glasgow, United Kingdom.

- Member of the Local Organizing Committee of the workshop *Geometric Control and Related Fields*, November 17–21 2014, RICAM, Linz, Austria.

- Organizer of the session: *Numerical Methods for Atmospheric Models* at the 14th International Conference on Hyperbolic Problems, June 25–29 2012, Padova, Italy.

Participation in PhD Thesis Committees

Shahroz Khan,PhD Naval Engineering, University of Strathclyde UK, 2023.
Christoph Hoeppke,PhD Mathematics, University of Oxford, UK, 2023.
Galo Hernández, PhD Mathematics, Universidad de la Frontera, Chile, 2022.
Guillermo Albuja, PhD Mathematics, Universidad de la Frontera, Chile, 2021.
Bartosz Jaroszkowski, PhD Mathematics, University of Sussex, United Kingdom, 2021.
Luca Saluzzi, PhD Mathematics, Gran Sasso Science Institute, Italy, 2020.
Daniel Inzunza , PhD Mathematical Engineering, Universidad de Concepción, Chile, 2019.

Refereeing for research funding agencies

National Commission for Scientific and Technological Research (CONICYT/ANID-Chile), Engineering and Physical Sciences Research Council (EPSRC-UK), German Research Foundation (DFG).

Foundations of Computational Mathematics
SIAM Journal on Mathematical Analysis
SIAM Journal on Numerical Analysis
SIAM Journal on Optimization and Control
SIAM Journal on Scientific Computing
SIAM Journal on Mathematical Analysis
SIAM/ASA Journal on Uncertainty Quantification
Multiscale Modeling and Simulation
Inverse Problems
Automatica
Mathematical Control and Related Fields
Applied Mathematics & Optimization
Journal of Optimization Theory and Applications
Kinetic and Related Models
ESAIM: COCV
ESAIM: M2AN
Computational Optimization and Applications
Computers and Mathematics with Applications
Advances in Computational Mathematics
Numerical Linear Algebra with Applications
Proceedings of the Royal Society A
IMA Journal on Applied Mathematics
Set-Valued and Variational Analysis
Quarterly Journal of the Royal Meteorological Soc.

Systems & Control Letters
Discrete and Continuous Dynamical Systems - A
BIT Numerical Mathematics
IEEE Transactions on Control Systems Technology
IEEE Control Systems Letters
ZAMM
Calcolo
Physica A
Applied Mathematics and Computation
Applied Numerical Mathematics
Mathematics and Computers in Simulation
Computational and Applied Mathematics
Optimization and Engineering
Royal Society Open Science
Optimization
Operational Research: An International Journal
European Control Conference
Statistics and Computation
Analysis and Mathematical Physics
Reviewer for MathScinet
Book Proposals Reviewer for CRC Press
Book Proposals Reviewer for Springer
Book Proposals Reviewer for SIAM
Book Reviews for SIAM Review

Complete Publication List

Up-to-date preprint versions available at `https://www.dkalise.net/publications`

Edited volumes:

M. Heinkenschloss, R. Herzog, D. Kalise, G. Stadler and E. Trélat (eds.) *Optimization and Control for Partial Differential Equations: Uncertainty quantification, open and closed-loop control, and shape optimization*, Vol. 29 De Gruyter - Radon Series on Computational and Applied Mathematics, 2022.

D. Kalise, K. Kunisch and Z. Rao (eds.) *Hamilton-Jacobi-Bellman Equations: Numerical Methods and Applications in Optimal Control*, Vol. 21 De Gruyter - Radon Series on Computational and Applied Mathematics, 2018.

M.S. Aronna, D. Kalise, and D. Tonon (eds.) *Novel Directions in Optimization, Control and Games with Applications*, Lecture Notes in Mathematics, Springer, 2017.

Preprints:

G. Albi, S. Bicego and D. Kalise. *Supervised learning for high-dimensional kinetic consensus control*, 2023.

Y.-P. Choi, D. Kalise and A. Peters. *Collisionless and Decentralized Formation Control for Strings*, arXiv:2102.13621, 2021.

Peer-reviewed Indexed Papers:

S. Dolgov, D. Kalise and L. Saluzzi. *Data-driven Tensor Train Gradient Cross Approximation for Hamilton-Jacobi-Bellman Equations*, arXiv:2205.05109, to appear in SIAM Journal on Scientific Computing.

D. Kalise, N.K. Nichols, D.I.A. Poll, C.A. Wells and P.D. Williams. *Minimising emissions from flights through realistic wind fields with varying aircraft weights*, Transportation Research Part D 117(2023): 103660.

D. Kalise, A. Sharma and M.V. Tretyakov. *Consensus based optimization via jump-diffusion stochastic differential equations*, Mathematical Models and Methods in Applied Sciences 33(2)(2023): 289–339.

A. Alla, D. Kalise and V. Simoncini. *State-dependent Riccati equation feedback stabilization for nonlinear PDEs*, Advances in Computational Mathematics 49(2023): 9.

A. J. King, S. J. Portugal, D. Strömbom, R. P. Mann, J. Carrillo, D. Kalise, G. de Croon, H. Barnett, P. Scerri, R. Gross, D. Chadwick, M. Papadopolou. *Biologically inspired herding of animal groups by robots.* Methods in Ecology and Evolution, 00, 1– 9 (2023).

S. Dolgov, D. Kalise and L. Saluzzi. *Optimizing semilinear representations for State-dependent Riccati Equation-based feedback control*, IFAC-PapersOnline 55(30)(2022): 510-515.

A. Borovykh, D. Kalise, A. Laignelet and P. Parpas. *Data-driven initialization of deep learning solvers for Hamilton-Jacobi PDEs*, IFAC-PapersOnline 55(30)(2022): 168-173.

G. Albi, S. Bicego and D. Kalise. *Supervised learning for kinetic consensus control*, IFAC-PapersOnline 55(30)(2022): 103-108.

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