

Milan Korda

LAAS-CNRS, Team POP

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Education

École Polytechnique Fédérale de Lausanne

Switzerland

PHD IN AUTOMATIC CONTROL

2012 – 2016

- Supervisor: Prof. Colin N. Jones
- Thesis: Moment-sum-of-squares hierarchies for set approximation and optimal control
- Referees: Jean-Bernard Lasserre, Anders Rantzer, Aude Billard

Czech Technical University in Prague

Czech Republic

MASTER IN CYBERNETICS AND ROBOTICS

2009 – 2011

- Thesis: Stochastic Model Predictive control, conducted at ETH Zurich, group of John Lygeros
- First Class Honours; GPA 4.0 / 4.0

Czech Technical University in Prague

Czech Republic

BACHELOR IN ELECTRICAL ENGINEERING

2006 – 2009

- First Class Honours; GPA 4.0 / 4.0

Professional Experience

- Since 2018 **Researcher (Chargé de Recherche)**, LAAS-CNRS, Toulouse, France
- Since 2019 **Researcher**, Czech Technical University in Prague, Czech Republic
- 2016 – 2018 **SNSF Postdoctoral Fellow & Postdoctoral scholar**, University of California, Santa Barbara, USA. Group of Igor Mezić. Research topic: Data-driven analysis and control of complex dynamical systems

Projects (since 2020)

- 2024-2027 **TENORS** Tensor modeling, geometry and optimisation. European Commission HORIZON-MSCA-2023-DN-JD. Role: PhD student supervisor
- 2023-2028 **ROBOPROX** Robotics and advanced industrial production. Role: Leader of one of the two workpackages
- 2022-2026 **DESCARTES** CNRS@CREATE Program on Intelligent Modelling for Decision-making in Critical Urban Systems. Role: Task leader
- 2019-2023 **ANITI** Artificial and Natural Intelligence Toulouse Institute. Role: Associate chair member with the chair of Global optimization.
- 2019-2022 **POEMA** Polynomial Optimization, Efficiency through Moments and Algebra. European Commission Marie Skłodowska-Curie Innovative Training Network. Role: PhD student supervisor
- 2020-2022 **KOOPMAN** Koopman operator for complex dynamical systems. Czech Science Foundation (GACR) junior research grant. Role: PI
- 2021-2022 Control of infinite-dimensional systems with nonlinear and learning elements in the loop: A Fading memory purpose. ANR Labex CIMI within the French State Programme "Investissement d'Avenir". Role: co-PI.

Phd and Postdoc supervision

POSTDOCS

- 2021-2022 **Philipp Di Dio** Moment-SOS hierarchies for optimal transport and partial differential equations. Now a research fellow at University of Konstanz.
- 2021-2023 **Rodolfo Rios-Zertuche** Relaxation gap between variational problems and their occupation measure relaxations. Now a postdoc at University of Tromso and researcher at CTU Prague.
- 2021-2022 **Nicolas Augier** Quantum Optimal Control and symmetry exploitation. Now a Chargé de Recherche at LAAS-CNRS.

PHD STUDENTS

- To start 09/2024 **Karolína Sehnalová** Occupation measure relaxation of partial differential equations. With Didier Henrion and Martin Kružík at CTU Prague.
- 2023 - now **Guo Yue** The Koopman operator framework for parameter-varying systems. With Qianxiao Li at NUS Singapore.
- 2020-2023 **Corbinian Schlosser** Structure exploitation in moment-sum-of-squares hierarchies for dynamical systems. With Pierre Weiss. Now a Postdoc at INRIA Paris.
- 2020-2023 **Vit Cibulka** The Koopman operator approach for nonlinear control. On cotutelle with CTU Prague. Now to start a postdoc at University of California, Santa Barbara.
- 2021-2023 **Alexey Lazarev** Advanced data-driven techniques for the Lasserre hierarchy. With Victor Magron and Jean-Bernard Lasserre. Now PhD candidate at Institut de Mathématiques de Toulouse.

Events organized (since 2020)

- 2023 Minisymposium on Koopman Operator in Dynamical Systems. SIAM Conference on Dynamical Systems, Portland, USA
- 2022 International Symposium on Nonlinear Theory and Its Applications (NOLTA), virtual, technical program committee member
- 2022 Invited session on Polynomial optimization: theory and application to nonlinear systems and PDEs. International Conference on Continuous Optimization (ICCOPT), Bethlehem, USA
- 2022 - now Brainpop online seminar series on polynomial optimization.
- 2022 EUR- MINT summer school on Moments and Positive polynomials and their applications, Toulouse, France.
- 2021 Invited session on Polynomial optimization. 18th Workshop on Advances in Continuous Optimization (EUROPT)
- 2021 Minisymposium on Optimization over measures and positive polynomials. Congres SMAI, Toulouse
- 2021 2021 Minisymposium on Koopman Operator: Computational Methods and Interactions with Machine Learning, SIAM Conference on Dynamical Systems, virtual
- 2021 Learning week within the H2020 Marie Skłodowska-Curie International Training Network POEMA. Le Village, Toulouse, France

Invited talks (since 2020)

- 2024 MFO Oberwolfach workshop on Polynomial Optimization for Nonlinear Dynamics: Theory, Algorithms, and Applications. Tentative talk title “Occupation measure relaxations for optimal control of partial differential equations”.
- 2024 CIRM workshop Variational Analysis, Models and Methods in Measure Space, tentative talk title “On the relaxation gap between a variational problem and its occupation measure relaxation”
- 2023 MFO Oberwolfach workshop on Real Algebraic Geometry with a View toward Koopman Operator Methods. Talk title “Operator theory and optimization in dynamical systems”.

- 2022 CWI Amsterdam, talk title “The moment-SOS hierarchy in dynamical systems and control: basics and new results for calculus of variations and PDEs”.
- 2022 MFO Oberwolfach workshop on Conic Linear Optimization for Computer-Assisted Proofs, talk title “Stability Verification of Dynamical Systems Controlled by Neural Networks using Semidefinite Programming”.
- 2022 Focused research group titled “Studying PDE dynamics via optimization with integral inequality constraints”. Banff International Research Station for Mathematical Innovation and Discovery, Banff, Canada.
- 2021 41st International Summer School of Automatic Control, Grenoble. Lecture title “The Koopman operator framework for analysis and control of nonlinear dynamical systems”.
- 2021 SIAM Conference on Optimization (virtual). Talk title “Stability Verification of Dynamical Systems Controlled by Neural Networks using Semidefinite Programming”
- 2021 Workshop of the Department of Optimization of LAAS-CNRS. Talk title “Stability and performance verification of dynamical systems controlled by neural networks: algorithms and complexity”.
- 2020 Singapore NUS, department of mathematics (virtual). Talk title “The moment sum-of-squares hierarchy in dynamical systems and control: overview and sparsity exploitation”.
- 2020 POEMA 2nd Workshop (virtual). Talk title “The moment sum-of-squares hierarchy in dynamical systems and control: basics and new developments”.

Referee and editorial activity

Associate Editor for the European Control Conference (ECC) from 2019

Member of the organization committee and associate editor for the 2022 International Symposium on Nonlinear Theory and Its Applications (NOLTA)

Referee for the PhD thesis of Hans Oeri at the University of Victoria, Canada (2023)

Referee of a tenure track application (2023)

Regular reviewer for a large number of leading journals and conferences in control, optimization and dynamical systems including Automatica (69 reviews), IEEE-TAC (59 reviews), SIOPT, SICON, SIADS, IEEE-CDC etc.