

## Operator Theoretic Methods in Dynamic Data Analysis and Control

### Monday February 11, 2019

- 8:00–8:55 *Check-In/Light Breakfast (Hosted by IPAM)*
- 8:55–9:00 *Welcome & Opening Remarks: Dean Miguel García-Garibay (Dean of Physical Sciences, UCLA) and Dima Shlyakhtenko (Director, IPAM)*
- 9:00–9:40 **Igor Mezic** (University of California, Santa Barbara (UCSB))  
*Koopman Operator Theory for Dynamical Systems, Control and Data Analytics*
- 9:50–10:10 *Break*
- 10:10–10:50 **Ryan Mohr** (University of California, Santa Barbara (UCSB))  
*The Koopman Operator, Diffusion Maps, and Partially Known Dynamics*
- 11:00–11:20 *Break*
- 11:20–12:00 **Frank Noe** (Freie Universität Berlin)  
*Variational approximation of dynamical systems using machine learning*
- 12:10–1:30 *Lunch (on your own)*
- 1:30–2:10 **Amit Surana** (United Technologies Research Center)  
*Tensor Dynamic Mode Decomposition*
- 2:20–2:40 *Break*
- 2:40–3:20 **Zlatko Drmač** (University of Zagreb)  
*Data driven Koopman spectral analysis - a numerical linear algebra perspective*
- 3:30–5:30 *Poster Session & Reception (Hosted by IPAM)*

### Tuesday February 12, 2019

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00–9:40 **Gary Froyland** (University of New South Wales)  
*An overview of transfer operator methods in nonautonomous dynamics: geometry, spectrum, and data.*
- 9:50–10:10 *Break*
- 10:10–10:50 **Nader Motee** (Lehigh University)  
*Koopman Performance Analysis of Nonlinear Networks*
- 11:00–11:20 *Break*

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- 11:20–12:00 **Didier Henrion** (Centre National de la Recherche Scientifique (CNRS))  
*Computing invariant measures with the Lasserre hierarchy*
- 12:10–1:30 *Lunch (on your own)*
- 1:30–2:10 **Irène Waldspurger** (Université de Paris IX (Paris-Dauphine))  
*Rank optimality for the Burer-Monteiro factorization*
- 2:20–2:40 *Break*
- 2:40–3:20 **Milan Korda** (Centre National de la Recherche Scientifique (CNRS))  
*Learning Koopman eigenfunctions for prediction and control: the transient case*

### Wednesday February 13, 2019

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00–9:40 **Mihai Putinar** (University of California, Santa Barbara (UCSB))  
*Perturbation of the Christoffel-Darboux kernel in several variables*
- 9:50–10:10 *Break*
- 10:10–10:50 **Tillmann Weisser** (Los Alamos National Laboratory)  
*A Moment Approach to Approximating Functional Solutions*
- 11:00–11:20 *Break*
- 11:20–12:00 **Jean Lasserre** (Université de Toulouse III (Paul Sabatier))  
*Extracting classical solutions from « truncated moment solutions » of weak formulations of some ODEs and PDEs.*
- 12:10–1:30 *Lunch (on your own)*
- 1:30–2:10 **Alexandre Mauroy** (Université de Namur)  
*Dual identification methods in Koopman operator theory: from ODEs to PDEs*
- 2:20–2:40 *Break*
- 2:40–3:20 **Nelida Črnjarić-Žic** (University of Rijeka)  
*Stochastic Koopman operator and the numerical approximations of its spectral objects*
- 3:30–3:50 *Break*
- 3:50–4:30 **Yuri Latushkin** (University of Missouri-Columbia)  
*The Maslov index and the spectrum of differential operators.*

## Thursday February 14, 2019

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00–9:40 **J. Nathan Kutz** (University of Washington)  
*Deep learning for universal linear embeddings of nonlinear dynamics*
- 9:50–10:10 *Break*
- 10:10–10:50 **Umesh Vaidya** (Iowa State University)  
*Sample Complexity of Nonlinear Optimal Control*
- 11:00–11:20 *Break*
- 11:20–12:00 **Hiroya Nakao** (Tokyo Institute of Technology)  
*Koopman eigenfunctionals and reduced description of partial differential equations*
- 12:10–1:30 *Lunch (on your own)*
- 1:30–2:10 **Maria Infusino** (Universität Konstanz)  
*The realizability problem for point processes: explicit constructions on the lattice.*
- 2:20–2:40 *Break*
- 2:40–3:20 **Senka Maćešić** (University of Rijeka)  
*Data-driven algorithms for nonautonomous Koopman operator*
- 3:30–3:50 *Break*
- 3:50–4:30 **Enoch Yeung** (University of California, Santa Barbara (UCSB))  
*Data-Driven Discovery with Deep Koopman Operators: Novel Basis Functions with Approximate Closure and Operational Envelopes in Biological Systems*

## Friday February 15, 2019

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00–9:40 **Maria Fonoberova** (AIMdyn)  
*Koopman Mode Analyses of Agent Based Modeling of Urban Insurgence and Sea Ice Concentration*
- 9:50–10:10 *Break*
- 10:10–10:50 **Oliver Junge** (Technical University of Munich)  
*Robust FEM-based extraction of finite-time coherent sets using scattered, sparse, and incomplete trajectories*
- 11:00–11:20 *Break*

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- 11:20–12:00 **Peter Schmid** (Imperial College)  
*Towards analysis and prediction of rare events in turbulent flows*
- 12:10–1:30 *Lunch (on your own)*
- 1:30–2:10 **Dimitris Giannakis** (New York University)  
*Reproducing kernel Hilbert space approaches for spectral analysis of dynamical systems*
- 2:20–2:40 *Break*
- 2:40–3:20 **Krithika Manohar** (California Institute of Technology)  
*Dimension-Reduced Dynamics From Slow-Fast Systems Using Diffusion Kernels*

