

Machine Learning for Physics and the Physics of Learning Tutorials

Thursday September 5, 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)*
- 9:00–10:15 **Frank Noe** (Freie Universität Berlin)
Intro to Machine Learning part 1
- 10:15–10:45 *Break*
- 10:45–12:00 **Steve Brunton** (University of Washington)
Dynamical Systems part 1
- 12:00–12:30 *Core Orientation*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–3:15 **Tristan Bereau** (Max Planck Institute for Polymer Research)
Constructing Conservation Laws with Machine Learning for Energy Landscapes
- 3:15–3:45 *Break*
- 3:45–5:00 **Anatole von Lilienfeld** (University of Basel)
Introduction to Electronic Structure Calculations

Friday September 6, 2019

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–10:15 **Frank Noe** (Freie Universität Berlin)
Intro to Machine Learning part 2
- 10:15–10:45 *Break*
- 10:45–12:00 **Steve Brunton** (University of Washington)
Dynamical Systems part 2
- 12:00–2:00 *Lunch (on your own)*
- 2:00–3:15 **Marina Meila** (University of Washington)
Manifold Learning
- 3:15–3:45 *Break*
- 3:45–5:00 **Gianni De Fabritiis** (Universitat Pompeu Fabra)
Machine Learning for Drug Design



Monday September 9, 2019

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–10:15 **Patrick Riley** (Google)
Data preparation and feature engineering
- 10:15–10:45 *Break*
- 10:45–12:00 **Lars Ruthotto** (Emory University)
Deep Neural Networks Motivated By Differential Equations I
- 12:00–2:00 *Lunch (on your own)*
- 2:00–3:15 **Andrew Ferguson** (University of Chicago)
Machine learning-enabled enhanced sampling in biomolecular simulation and data-driven design of self-assembling photonic crystals and optoelectronic π -conjugated oligopeptides
- 3:15–3:45 *Break*
- 3:45–5:00 **Kyle Cranmer** (New York University)
The interplay between physically motivated simulations and machine learning

Tuesday September 10, 2019

- 8:00–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–10:15 **Patrick Riley** (Google)
Graph based neural networks for prediction and generation
- 10:15–10:45 *Break*
- 10:45–12:00 **Lars Ruthotto** (Emory University)
Deep Neural Networks Motivated By Differential Equations II
- 12:00–2:00 *Lunch (on your own)*
- 2:00–3:15 **Frank Noe** (Freie Universität Berlin)
Connection between Statistics and Machine Learning
- 3:15–3:45 *Break*
- 3:45–5:00 **Steve Brunton** (University of Washington)
Introduction to Fluid Mechanics

