

Deep Learning and Medical Applications

Monday January 27, 2020

- 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)*
- 9:00–9:50 **Jin Keun Seo** (Yonsei University)
Deep Learning-Based Solvability of Underdetermined Inverse Problems in Medical Imaging
- 10:00–10:15 *Break*
- 10:15–11:05 **Lars Ruthotto** (Emory University)
A Machine Learning Framework for Optimal Transport of High-Dimensional Densities
- 11:15–11:30 *Break*
- 11:30–12:20 **Michael Unser** (École Polytechnique Fédérale de Lausanne (EPFL))
Splines and imaging: From compressed sensing to deep neural networks
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Stanley Osher** (University of California, Los Angeles (UCLA))
Trustworthy deep learning
- 3:30–4:30 *Break*
- 4:30–5:30 **Jill Mesirov** (University of California, San Diego (UCSD))
Can We Use Genomics to Better Understand and Treat Cancer?
- 5:30–7:00 *Poster Session & Reception (Hosted by IPAM)*

Tuesday January 28, 2020

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **Ulugbek Kamilov** (Washington University in St. Louis)
Computational Imaging: Reconciling Models and Learning
- 10:00–10:15 *Break*
- 10:15–11:05 **Dosik Hwang** (Yonsei University)
Deep Learning-based MR Image Reconstruction and Contrast Conversion.
- 11:15–11:30 *Break*

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- 11:30–12:20 **Georg Langs** (Medizinische Universität Wien)
Deep learning for anomaly detection: expanding our marker vocabulary
- 12:30–1:45 *Lunch (on your own)*
- 1:45–2:35 **Gitta Kutyniok** (Technische Universität Berlin)
Deep Learning and Modeling: Taking the Best out of Both Worlds
- 2:45–3:00 *Break*
- 3:00–3:50 **Jong Chul Ye** (Korea Advanced Institute of Science and Technology (KAIST))
Geometric Understanding of Supervised and Unsupervised Deep Learning for Biomedical Image Reconstruction
- 4:30–5:30 **Jill Mesirov** (University of California, San Diego (UCSD))
Computational Genomic Approaches to the Understanding and Treatment of Cancer
- 5:30–7:00 *Reception (Location: IPAM Lobby)*

Wednesday January 29, 2020

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **Jill Mesirov** (University of California, San Diego (UCSD))
Molecular signatures drive the understanding and treatment of cancer
- 10:00–10:15 *Break*
- 10:15–11:05 **Ivana Isgum** (Amsterdam University Medical Center)
Deep learning for cardiovascular image analysis
- 11:15–11:30 *Break*
- 11:30–12:20 **Jamie Haddock** (University of California, Los Angeles (UCLA))
Scaling the Hierarchical Topic Modeling Mountain: Neural NMF and Iterative Projection Methods
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Bao Wang** (University of California, Los Angeles (UCLA))
Momentum in Stochastic Gradient Descent and Deep Neural Nets
- 3:30–4:00 *Break*
- 4:00–4:50 **Pablo Suarez-Serrato** (National Autonomous University of Mexico (UNAM))
Quantifying the Topology of Coma

Thursday January 30, 2020

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **Florian Knoll** (New York University)
MR image acquisition and reconstruction in the era of deep learning
- 10:00–10:15 *Break*
- 10:15–11:05 **Ender Konukoglu** (ETH Zurich)
On Bayesian models with networks for reconstruction and detection
- 11:15–11:30 *Break*
- 11:30–12:20 **Tom Vercauteren** (King's College London)
Flexible machine learning approaches for computer-assisted surgery
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:50 **Greg Zaharchuk** (Stanford University)
AI-based Image Transformation and its Impact on Radiology
- 3:00–3:15 *Break*
- 3:15–4:05 **Ben Glocker** (Imperial College)
Causality matters in medical imaging

Friday January 31, 2020

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **Marc Niethammer** (University of North Carolina)
Deep Learning for Medical Image Registration
- 10:00–10:15 *Break*
- 10:15–11:05 **Daniel Rueckert** (Imperial College)
Deep learning and shape modelling for medical image reconstruction, segmentation and analysis

