

Explainable AI for the Sciences: Towards Novel Insights

Monday January 9, 2023

- 8:00–8:55 *Check-in/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 *Session Chair: Tulay Adali*
- 9:00–9:50 **Bolei Zhou** (University of California, Los Angeles (UCLA))
From Network Dissection to Policy Dissection: Discovering Emergent Concepts in Deep Representations
- 10:00–10:15 *Break*
- 10:15–11:05 **Klaus-Robert Müller** (Technische Universität Berlin)
Virtual Talk:
- 11:15–11:30 *Break*
- 11:30–12:20 **Xiao Fu** (Oregon State University)
Understanding Multiview and Self-Supervised Representation Learning: A Nonlinear Mixture Identification Perspective
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Jaesik Choi** (Korea Advanced Institute of Science and Technology (KAIST))
Explainable Artificial Intelligence to Analyze Internal Decision Mechanism of Deep Neural Networks
- 3:30–3:50 *Break*
- 3:50–4:40 **Bin Yu** (University of California, Berkeley (UC Berkeley))
Virtual Talk: Interpreting Deep Neural Networks towards Trustworthiness
- 4:45–5:20 *Lightning Poster Session*
- 5:20–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday January 10, 2023

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *SESSION CHAIR: Michele Ceriotti*
- 9:00–9:50 **Osbert Bastani** (University of Pennsylvania)
Interpretable Machine Learning via Program Synthesis
- 10:00–10:15 *Break*

(Tuesday schedule continued on next page)



(Tuesday schedule continued from previous page)

- 10:15–11:05 **Wojciech Samek** (Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute, HHI)
Virtual Talk: Concept-Level Explainable AI
- 11:15–11:30 *Break*
- 11:30–12:20 **Tülay Adalı** (University of Maryland Baltimore County)
Matrix and Tensor Factorizations for Data Fusion: Focus on Model Match, Interpretability, and Reproducibility
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Frederick Klauschen** (Ludwig-Maximilians-Universität München)
AI in cancer research and diagnostics

Wednesday January 11, 2023

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00 *SESSION CHAIR: Pamela Douglas*
- 9:00–9:50 **Evrin Acar** (Simula Research Laboratory)
Virtual Talk: Extracting Insights from Complex Data: Constrained Multimodal Data Mining using Coupled Matrix and Tensor Factorizations
- 10:00–10:15 *Break*
- 10:15–11:05 **Michele Ceriotti** (École Polytechnique Fédérale de Lausanne (EPFL))
Physical insights from atomic-scale machine learning
- 11:15–11:30 *Break*
- 11:30–12:20 **Cecilia Clementi** (Freie Universität Berlin)
Efficient algorithms for Non-Local Filtering and applications to Cryo-Electron microscopy and biological microscopy
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Petros Koumoutsakos** (Harvard University)
Alloys of Artificial Intelligence and Scientific Computing for Fluid Mechanics
- 3:30–3:50 *Break*
- 3:50–4:40 **Gregoire Montavon** (Freie Universität Berlin)
Virtual Talk: Towards Higher-Order and Disentangled Explainable AI

Thursday January 12, 2023

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **André Freitas** (University of Manchester)
Building explanation machines for science: a neuro-symbolic perspective
- 10:00–10:15 *Break*
- 10:15–11:05 **Matteo Valleriani** (Technische Universität Berlin)
XAI Historian
- 11:15–11:30 *Break*
- 11:30–12:20 **Oliver Eberle** (Technische Universität Berlin)
Explainable structured machine learning in similarity, graph and transformer models.
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Anders Søgaard** (University of Copenhagen)
What's Opaque to Whom - and Why?
- 3:30–3:50 *Break*
- 3:50–4:40 *Panel Discussion*

Friday January 13, 2023

- 8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*
- 9:00–9:50 **Vince Calhoun** (Georgia Institute of Technology)
Title not available
- 10:00–10:15 *Break*
- 10:15–11:05 **Pamela Douglas** (UCLA Medical School)
TBA
- 11:15–11:30 *Break*
- 11:30–12:20 **Nikolaus Kriegeskorte** (Columbia University)
Controversial stimuli: Optimizing experiments to adjudicate among computational hypotheses
- 12:30–2:30 *Lunch (on your own)*
- 2:30–3:20 **Lisa Nickerson** (Harvard Medical School)
Addressing Confounds in Neuroimaging Machine Learning Predictions

