

Workshop III: Naturalistic Approaches to Artificial Intelligence

Monday November 4, 2024

- 8:00–8:55 *Check-In/Breakfast (Hosted by IPAM)*
- 8:55–9:00 *Welcome and Opening Remarks*
- 9:00 *SESSION CHAIR: Jacob Foster*
- 9:00–9:50 **Stephanie Forrest** (Arizona State University)
Biology of Computation
- 10:00–10:15 *Break*
- 10:15–11:05 **Sanjoy Dasgupta** (University of California, San Diego (UCSD))
Neural machines: From fruit flies to embedded devices
- 11:15–11:30 *Break*
- 11:30–12:20 **David Wolpert** (Santa Fe Institute)
From Smith's Invisible Hand to Distributed Optimization and Control
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *SESSION CHAIR: Jacob Foster*
- 2:30–3:20 **Levi Lelis** (University of Alberta)
Learning Libraries of Programmatic Policies
- 3:30–4:00 *Break*
- 4:00–4:50 **Christopher Hillar** (University of California, Berkeley (UC Berkeley))
From McCulloch-Pitts to Retina
- 5:00–5:15 *Lightning Poster Session*
- 5:15–6:30 *Poster Session & Reception (Hosted by IPAM)*

Tuesday November 5, 2024

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *SESSION CHAIR: Erica Cartmill*
- 9:00–9:50 **Andrew Barron** (Macquarie University)
Honey bee intelligence: thinking with one million neurons
- 10:00–10:15 *Break*

(Tuesday schedule continued on next page)



(Tuesday schedule continued from previous page)

- 10:15–11:05 **Tai-Danae Bradley** (SandboxAQ)
An Enriched Category Theory of Language
- 11:15–11:30 *Break*
- 11:30–12:20 **David Spivak** (Topos Institute)
Plausible Fiction: Accounting for Potential Actualization
- 12:30 *Group Photo*
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *SESSION CHAIR: Stephanie Forrest*
- 2:30–3:20 **Tom Griffiths** (Princeton University)
Understanding human intelligence through human limitations
- 3:30–4:00 *Break*
- 4:00–4:50 **Mehrnoosh Sadrzadeh** (University College London)
How can large language models become more human?

Wednesday November 6, 2024

- 9:30–10:30 *Check-In/Breakfast (Hosted by IPAM)*
- 10:30–11:30 *Discussion*
- 11:30–1:30 *Lunch (on your own)*
- 1:30 *SESSION CHAIR: Tom Griffiths*
- 1:30–2:20 **Michael Levin** (Tufts University)
Non-neural intelligence: biological architectures for problem-solving in diverse spaces
- 2:30–2:45 *Break*
- 2:45–3:35 **Sean Tull** (Quantinuum)
Towards Compositional Interpretability for XAI
- 3:45–4:00 *Break*
- 4:00–4:50 **Martha Lewis** (University of Amsterdam)
Compositional Approaches to Modelling Language and Concepts

Thursday November 7, 2024

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *SESSION CHAIR: Martha Lewis*
- 9:00–9:50 **Sumit Gulwani** (Microsoft - Redmond, WA)
Program Synthesis: Applications, Experiences, and Neuro-Symbolic Techniques
- 10:00–10:15 *Break*
- 10:15–11:05 **Kevin Ellis** (Cornell University)
Probabilistic Thinking in Language and Code
- 11:15–11:30 *Break*
- 11:30–12:20 **Aishni Parab** (University of California, Los Angeles (UCLA))
Extracting Structured Data from Multi-Modal Input
- 12:30–2:30 *Lunch (on your own)*
- 2:30 *SESSION CHAIR: Martha Lewis*
- 2:30–3:20 **Erik Winfree** (California Institute of Technology)
Equilibrium is inference: lessons from a model of liquid-liquid phase separation
- 3:30–4:00 *Break*
- 4:00–4:50 **Swarat Chaudhuri** (University of Texas at Austin)
Abstraction and Evolution with Large Language Models

Friday November 8, 2024

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *SESSION CHAIR: Sumit Gulwani*
- 9:00–9:50 **Una-May O-Reilly** (Massachusetts Institute of Technology)
Adversarial Intelligence in Natural and Artificial Systems
- 10:00–10:15 *Break*
- 10:15–11:05 **Rupak Majumdar** (Max Planck Institute for Software Systems)
Sequential Decision Making with Information Asymmetry
- 11:15–11:30 *Break*

(Friday schedule continued on next page)

(Friday schedule continued from previous page)

- 11:30–12:20 **Pronita Mehrotra** (MindAntix, Inc.)
Cognitive Mechanisms That Power Learning and Creativity
- 12:30–2:00 *Lunch (on your own)*
- 2:00 *SESSION CHAIR: Sumit Gulwani*
- 2:00–2:50 **Josh Tenenbaum** (Massachusetts Institute of Technology)
Scaling Intelligence the Human Way
- 3:00–3:30 *Break*

