Machine Assisted Proofs

Monday February 13, 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: Terence Tao (University of California, Los Angeles)*

9:00–9:50 **Adam Topaz** (University of Alberta)
Liquid Tensor Experiment

10:00–10:15 *Break*

10:15–11:05 **Benedikt Ahrens** (Delft University of Technology)
Univalent Foundations and the UniMath library

11:15–11:30 *Break*

11:30–12:20 **Andrej Bauer** (University of Ljubljana)
Formalizing invisible mathematics

12:30–2:30 *Lunch (on your own)*

2:30 *Session Chair: Jeremy Avigad (Carnegie Mellon University)*

2:30–3:20 **John Harrison** (Amazon Web Services)
Virtual Talk: a personal and historical perspective

3:30–4:00 *Break*

4:00–4:50 **Geordie Williamson** (University of Sydney)
What can the working mathematician expect from deep learning?

5:00–5:30 *Junior Participant Intros Part I*

5:30–6:45 *Reception (Location: IPAM Lobby)*

Tuesday February 14, 2023

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00 *Session Chair: Emily Riehl (Johns Hopkins University)*

9:00–9:50 **Marc Lackenby** (University of Oxford)
Using machine learning to formulate mathematical conjectures

10:00–10:15 *Break*

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10:15–11:05 **Leonardo de Moura** (Microsoft Research)
Virtual Talk: The Lean proof assistant: introduction and challenges

11:15–11:30 *Break*

11:30–12:20 **Adam Wagner** (Worcester Polytechnic Institute)
Finding counterexamples to conjectures via reinforcement learning

12:30–2:30 *Lunch (on your own)*

2:30 *Session Chair: Marc Lackenby (University of Oxford)*

2:30–3:20 **Haniel Barbosa** (Universidade Federal de Minas Gerais in Belo Horizonte)
Better SMT proofs for certifying compliance and correctness

3:30–4:00 *Break*

4:00–4:50 **Anne Baanen** (Vrije Universiteit)
Computing with or despite the computer

Wednesday February 15, 2023

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00 *Session Chair: Akshay Venkatesh (Institute for Advanced Study)*

9:00–9:50 **Micaela Mayero** (Galilee Institute - Paris Nord University)
Virtual Talk: An overview of the real numbers in theorem provers: an application with real analysis in Coq

10:00–10:15 *Break*

10:15–11:05 **Assia Mahboubi** (Institut National de Recherche en Informatique Automatique (INRIA))
Verifying computational mathematics

11:15–11:30 *Break*

11:30–12:20 **Patrick Massot** (Université Paris-Saclay)
Formal mathematics for mathematicians and mathematics students

12:30–12:40 *Group Photo - MAP2023*

12:40–2:30 *Lunch (on your own)*

2:30 *Session Chair: Jordan Ellenberg (University of Wisconsin-Madison)*

2:30–3:20 **Tony Wu** (Google)
Autoformalization with Large Language Models

3:30–4:00 *Break*

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4:00–4:50 *Panel - "Prospects in machine assisted proof" (Sophie Morel, Emily Riehl, Akshay Venkatesh)*

5:00–5:30 *Junior Participant Intros Part II*

Thursday February 16, 2023

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00 *Session Chair: Assia Mahboubi (Institut National de Recherche en Informatique Automatique)*

9:00–9:50 **Jason Rute** (IBM)
Deep learning in interactive theorem proving

10:00–10:15 *Break*

10:15–11:05 **Pascal Fontaine** (Université de Liège)
SMT: quantifiers, and future prospects

11:15–11:30 *Break*

11:30–12:20 **James Davenport** (University of Bath)
How to prove a calculation correct?

12:30–2:30 *Lunch (on your own)*

2:30 *Session Chair: Geordie Williamson (University of Sydney)*

2:30–3:20 **Maria Ines de Frutos Fernandez** (Imperial College London)
Formalizing Norm Extensions and Applications to Number Theory

3:30–4:00 *Break*

4:00–4:50 **Bohua Zhan** (Chinese Academy of Sciences)
Virtual Talk: Verifying symbolic computation in the HolPy theorem prover

Friday February 17, 2023

8:00–9:00 *Check-in/Breakfast (hosted by IPAM)*

9:00 *Session Chair: James Davenport (University of Bath)*

9:00–9:50 **Petra Hozzova** (Technische Universität Wien)
Automation of Induction in Saturation

10:00–10:15 *Break*

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10:15–11:05 **Johnathan Hanke** (Princeton University)
Computer-Assisted Proofs in the Arithmetic of Quadratic Forms

11:15–11:30 *Break*

11:30–12:20 **Heather Macbeth** (Fordham University at Lincoln Center)
Algorithm and abstraction in formal mathematics