Workshop
"Bridging between informal and formal"

July 8 - 12, 2024

organized by
Kevin Buzzard, Jacques Carette, Valeria de Paiva, Michael Kohlhase, Josef Urban

Time measurement: CEST

- **Monday, July 8**

10:00 - 10:30	*Arrival and Self-Registration*
10:30 - 10:40	*Welcome by HIM Director Christoph Thiele*
10:40 - 11:20	**Aarne Ranta** *Informath: Informalization of Formal Mathematics*
11:20 - 12:00	**Dennis Müller** *Injecting Formal Mathematics into LaTeX*
12:00 - 13:30	*Lunch break*
13:30 - 14:30	**Who am I** *All participants present their research/workshop interests in 2 min*
14:30 - 16:00	**Group Organization** *Distributions of workgroups and talks; be prepared to pitch your talks and your workgroup proposals*
16:00 - 16:30	*Coffee break*
16:30 - 18:00	**Workgroups**
from 18:00 on	*Get-Together*

- **Tuesday, July 9**

09:00 - 09:40	**Peter Koepke** *A Natural Language Formalization of Perfectoid Rings in Naproche*
09:40 - 10:20	**Frederik Schaefer** *A Framework for Prototyping Symbolic Natural Language Understanding*
10:20 - 10:50	*Group Photo and Coffee break*
10:50 - 11:30	**Valeria de Paiva and Lucy Horowitz** *Demo: three prototypes demo (Alignments)*
11:30 - 12:10	**Wojciech Nawrocki** *Demo: Commutative diagrams in Lean*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1 - Carlos Zapata-Carratala** *The importance of mathematical interface (eg notation, language design, definitions...) in higher-order structures (eg higher-arity algebras, higher homotopy, hypergraphs...).*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2 - Woijciech Nawrocki** *Auto-visualization of commutative diagrams in Lean (informalization of category theory)*

- **Wednesday, July 10**

09:00 - 09:40	**Silvia de Toffoli** *How to prove things with Diagrams*
09:40 - 10:20	**Stefania Dumbrava** *Towards a Knowledge Graph of Formalised Mathematics*
10:20 - 10:50	*Coffee break*
10:50 - 11:10	**Frederik Schaefer** *Annotating and Spotting in Mathematical Corpora (concepts and tools)*
11:10 - 11:30	**Josef Urban** *Autoformalization - ten years into the game. (A 20-minute talk about the various past, current and future approaches/ideas.)*
11:30 - 12:10	**Sander Dahmen and Alain Chavarri Villarello** *Computation and formalization: case studies in computational number theory*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1 - Jeremy Avigad and Ursula Martin** *Living deliberately in the age of AI+math*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2 - Silvia De Toffoli** *Errors in Formalization*

- **Thursday, July 11**

09:00 - 09:40	**Wenda Li** *Autoformalisation: Bridging the Gap between Informal and Formal Proofs*
09:40 - 10:20	**Carlos Zapata-Carratala** *Hypergraph Rewriting as a Foundation for Diagrammatic Calculus*
10:20 - 10:50	*Coffee break*
10:50 - 11:30	**Moa Johansson** *Neuro-symbolic architectures for asssisting auto-formalisation and mathematical discovery. This will be an overview of recently started and about-to-start work using neural networks to help with lemma discovery and "co-piloting" for proof assistants.*
11:30 - 12:10	**Shankar** *Cueology of Proof*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1 - Mateja Jamnik and Wenda Li** *The role and challenges of LLMs/neural methods in autoformalisation. We will be extremely interested in inputs from experts who use sympolic methods to parse natural languages, which are very likely to complement the neural approaches.*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2 - Shankar** *Proof portability across across multiple systems/representations (including natural language). Projects like OpenTheory and Dedukti have addressed this issue. What are some of the technical challenges and approaches for practical proof portability?*

- **Friday, July 12**

09:00 - 09:40	
09:40 - 10:20	
10:20 - 10:50	*Coffee break*
10:50 - 11:30	**Emily Riehl** *Formalizing post-rigorous mathematics*
11:30 - 12:10	**Adrian De Lon** *Natural theorem proving with Naproche-ZF*
12:10 - 14:00	*Lunch break*
14:00 - 16:00	**Workgroup 1 - Jacques Carette** *Deformalization, joint narration, and other views of doing both formal and informal at the same time (discussion)*
16:00 - 16:30	*Coffee break*
16:30 - 18:30	**Workgroup 2 - Frederik Schaefer** *Annotating and Spotting in Mathematical Corpora (Hands On)*