The FMCAD 2024 Student Forum

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***Abstract*—The Student Forum at the International Conference on Formal Methods in Computer–Aided Design (FMCAD) gives undergraduate and graduate students the opportunity to introduce their research to the Formal Methods community and receive feedback. In 2024, the event took place in Prague, Czechia. Twenty three students were invited to give a short talk and present a poster of their work.**

Since 2013, the FMCAD Student Forum provides a platform for undergraduate and graduate students at any career stage to present their research to the audience of the FMCAD conference. The 2024 edition of the FMCAD Student Forum follows the tradition of its predecessors, which took place in:

- Portland, Oregon, USA in 2013 [1]
- Lausanne, Switzerland in 2014 [2]
- Austin, Texas in 2015 [3] and 2018 [4]
- Mountain View, California, USA in 2016 [5]
- Vienna, Austria in 2017 [6]
- San Jose, California, USA in 2019 [7]
- Virtual in 2020 [8] and 2021 [9]
- Trento, Italy in 2022 [10]
- Ames, Iowa, USA in 2023 [11]

FMCAD 2024 hosted the twelves edition of the Student Forum. Graduate and undergraduate students were invited to submit two-page reports of their current research and ongoing work in the scope of the FMCAD conference. There were 24 submissions to the forum, 23 of them were accepted one of which was withdrawn. The Student Forum program committee reviews were based on the overall quality, novelty of the work, its potential impact on the Formal Methods community, as well as the potential positive impact on the student to have the opportunity to participate in the forum. The accepted submissions covered a wide range of topics relevant to the FMCAD community, from foundational aspects of automated reasoning, to analysis and verification of software, hardware, and neural networks, as well as applications of formal methods to security and dynamical system. Each submission received 3 reviews. The following contributions have been accepted[1] (excluding the withdrawn contribution):

- Csanád Telbisz and Dániel Szekeres *Correctness Witnesses for Concurrent Software Verification*
- Levente Bajczi and Marian Lingsch-Rosenfeld *Software Verification Witnesses for Weak Memory*
- Levente Bajczi *CHCs for Weak Memory*
- Islam Hamada *Incremental Construction of Inductive Invariants for Model Checking*
- Zsófia Ádám, Levente Bajczi, Marek Jankola and Marian Lingsch-Rosenfeld *Towards Validation of More Expressive Software Non-Termination Witnesses*
- Luke Miga *Verifying Axiomatic Microarchitectural Models in the Coq Proof Assistant*
- Konstantin Britikov *Analysis of Multiloop Programs With Nested Loops Using Transition Power Abstraction*
- Rachel Cleaveland *Theory of Strings in Symbolic Execution*
- Siddharth Priya *Optimizing Rust Programs Using Ownership*
- Daneshvar Amrollahi *Towards Improved Stability for SMT Solvers*
- John Kolesar *Coinductive Proofs of Regular Expression Equivalence in Zero Knowledge*
- Feitong Qiao *Timed Data Types for Hardware*
- Elizaveta Pertseva and Alex Ozdemir *Multimodular Reasoning for Satisfiability Modulo Theories*
- Fuqi Jia *A Theory-Agnostic SMT Sampling Framework*
- Milan Ganai *Hamilton-Jacobi Reachability Estimation*
- Samantha Archer *SymLeak: Quantifying Side Channel Leakage with Symbolic Execution*
- Daniel Mendoza *Towards LLM-assisted hardware verification*
- Edward Wang *Work-in-Progress: An SMT-Based, Correct-by-Construction Place-and-Route Framework*
- Michal Hečko *Automata-based Decision Procedure for Presburger Arithmetic Augmented with Algebraic Reasoning*
- Áron Ricardo Perez-Lopez and Samantha Archer *Word-Level Model Checking with IC3 in Pono*
- Roxana-Mihaela Timon *Verification of a dynamic programming-based algorithm for the Activity Selection Problem in Dafny*
- Márk Somorjai and Mihály Dobos-Kovács *Stack Abstraction for Interprocedural Software Verification*

We formed a program committee to cover a wide range of topics so students could receive expert feedback on their work. The 2024 FMCAD Student Forum program committee consisted of Martin Blicha (co-chair), Nestan Tsiskaridze (co-chair), Guy Amir, Haniel Barbosa, Armin Biere, Nikolaj Bjørner, William Eiers, Katalin Fazekas, Alberto Griggio,

[1]Only student authors listed for brevity.

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Arie Gurfinkel, Petra Hozzová, Antti Hyvärinen, Ahmed Irfan, Konstantin Korovin, Daniel Larraz, Ondřej Lengál, Alexander Nadel, Andres Noetzli, Rodrigo Otoni, Sophie Rain, Mark Santolucito, Christoph Sticksel, Hari Govind V. K., and Yoni Zohar.

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