The FMCAD 2023 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 2023, the event took place in Ames, Iowa, USA. Eighteen 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 2023 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]

FMCAD 2023 hosted the eleventh 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 16 submissions to the forum and all of them were accepted. 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 confidential computing, security and chemistry. Each submission received at least 2 reviews. The following contributions have been accepted[1]:

- Arijit Shaw: *Towards Building A Scalable Bit-vector Model Counter*
- Rachel Cleaveland: *MemGlue: An Update-Based Cache Coherence Protocol for Heterogeneous Hardware*
- Guy Amir: *Finding Formal Explanations of Reactive DNNs*

[1]Only student authors listed for brevity.

- Landon Taylor: *Enhancing Property-Directed Reachability for Chemical Reaction Networks*
- Benjamin Valpey: *Formal Analysis of Tensor Core Math via SMT*
- Samuel Coward: *Datapath Optimization, Analysis and Verification: E-Graphs Can Do It All*
- Joseph Tafese: *Btor2MLIR: A Format for Hardware Verification*
- Sophie Andrews and Matthew Sotoudeh: *Incremental Bounded Model Checking as Program Source Changes*
- Cayden Codel: *Modifying the DDFW Local Search Algorithm*
- Viansa Schmulbach: *Ordering Interventions for Hardware Security*
- Áron Ricardo Perez-Lopez and Akshay Srivatsan : *Mixed-Signal Verification via Digital Simulation*
- Raya Elsaleh: *On Facilitating the Development of Neural Networks Verifiers*
- Muhammad Usama Sardar: *Formal Specification and Verification of Attestation in Confidential Computing*
- Charles Pert: *Synthesizing Omega-Regular Expressions from Omega-automata*
- Tephilla Prince: *Two-dimensional Bounded Model Checking for Petri Nets*
- Ankit Shukla: *Simplifying Dependency Quantified Boolean Formulas with Biclique Cover Transformations*

We formed a program committee to cover a wide range of topics so students could receive expert feedback on their work. The 2023 FMCAD Student Forum program committee consisted of Mikolas Janota (co-chair), Nina Narodytska (co-chair), Haniel Barbosa, Jaroslav Bendík, Armin Biere, Nikolaj Bjørner, Martin Blicha, Martin Brain, Rayna Dimitrova, Katalin Fazekas, Mathias Fleury, Isabel Garcia, Arie Gurfinkel, Martin Jonas, Daniela Kaufmann, Konstantin Korovin, Corina Pasareanu, Mathias Preiner, Giles Reger, Andrew Reynolds, Karem Sakallah, Mark Santolucito, Carsten Sinz, Nestan Tsiskaridze, and Florian Zuleger.

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