The FMCAD 2025 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 2025, the event took place in Menlo Park, California, USA. Twenty 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 2025 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]
- Prague, Czech Republic in 2024 [12]

FMCAD 2025 hosted the thirteenth 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, of which 22 were reviewed and 20 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, and 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 systems. Each submission received 3 reviews. The following contributions have been accepted[1]:

- Nikil Shyamsunder: *Work-In-Progress: Building an Interpreter for an Imperative Hardware Interface Specification Language*
- Mason Davis: *VeRAPAk: Verification of Neural Network Robustness Through Refutation and Attack Methods*
- Joseph Tafese: *Actionable Feedback for eBPF Developers*
- Era Thaqi: *Symbolic Timing Analysis of Digital Circuits Using Analytic Delay Functions*
- Pedro Saccomani: *Towards a Proof-Producing Theory of Finite Fields*
- Yao Hsiao: *Consistency-Directed Formal Verification of Cache Coherence Protocol Implementations*
- Chuyue Sun: *Automated Verification of Data-Structure Modules in Verus*
- Liam Davis: *Lookahead Branching for Neural Network Verification*
- Sergei Leonov: *Two Strategies to Improve the Stålmarck Procedure*
- Joshua Jeppson: *Reasoning About Quantitative Rare-Event Reachability in Stochastic Vector Addition Systems via Affine Vector Spaces*
- Ian Dardik: *Towards Fully Automated Compositional Inductive Invariant Inference*
- Landon Taylor: *Tackling Scalability for Transient Reachability Analysis of Chemical Reaction Networks*
- Anna Eaton: *SimSpect: Automated Litmus Testing for Simulated Spectre Defenses*
- William Fishell: *Synthesizing State Space Models: Learning Meets Logic*
- Bingqing Hu: *Error-Guided Predicate Abstraction for Continuous-Time Markov Chains*
- Jibiana Jakpor: *Verifying cvc5's String Rewrite Rules Using Isabelle/HOL*
- Alexis Aurandt: *Towards Verified Runtime Monitors for Resource-Constrained Embedded Systems*
- Sam Akinwande: *An Inductive Approach to Verifying Neural Feedback Systems*
- Nick Waddoups: *Verification of Digital Network-on-Chip Systems Using Dafny*
- Thomas Hader: *Optimization for MCSat*

We formed a program committee to cover a wide range of topics so that students could receive expert feedback on their work. The 2025 FMCAD Student Forum program committee consisted of Tanja Schindler (co-chair), Lee A. Barnett (co-chair), Armin Biere, Nikolaj Bjørner, Roderick Bloem, Julie Cailler, Deepak D'Souza, Rayna Dimitrova, Constantin Enea, Mathias Fleury, Arie Gurfinkel, Clemens Hofstadler, Petra Hozzová, Marie-Christine Jakobs, Tim King, Katherine Kosaian, Kasper Luckow, Mark Santolucito, Jan Strejček, Jiyuan Wang, and Emily Yu.

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REFERENCES

[1] T. Wahl, "The FMCAD graduate student forum," in *Formal Methods in Computer–Aided Design, FMCAD 2013, Portland, OR, USA, October 20-23, 2013*. IEEE, 2013, pp. 16–17. [Online]. Available: https://doi.org/10.1109/FMCAD.2013.7035523

[2] R. Piskac, "The FMCAD 2014 graduate student forum," in *Formal Methods in Computer–Aided Design, FMCAD 2014, Lausanne, Switzerland, October 21-24, 2014*. IEEE, 2014, p. 13. [Online]. Available: https://doi.org/10.1109/FMCAD.2014.6987589

[3] G. Weissenbacher, "The FMCAD 2015 graduate student forum," in *Formal Methods in Computer–Aided Design, FMCAD 2015, Austin, Texas, USA, September 27-30, 2015*, R. Kaivola and T. Wahl, Eds. IEEE, 2015, p. 8. [Online]. Available: https://doi.org/10.1109/FMCAD.2015.7542246

[4] D. Jovanović and A. Reynolds, "The FMCAD 2018 graduate student forum," in *2018 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2018, p. 1, https://www.cs.utexas.edu/users/hunt/FMCAD/FMCAD18/student-forum/.

[5] H. Hojjat, "The FMCAD 2016 graduate student forum," in *Formal Methods in Computer–Aided Design (FMCAD), 2016*. IEEE, 2016, p. 8, https://fmcad.forsyte.at/FMCAD16/student-forum.html.

[6] K. Heljanko, "The FMCAD 2017 graduate student forum," in *Proceedings of the 17th Conference on Formal Methods in Computer–Aided Design*. FMCAD Inc, 2017, p. 10, https://fmcad.org/FMCAD17/student-forum/.

[7] G. Fedyukovich, "The FMCAD 2019 student forum," in *2019 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2019, p. 1, https://fmcad.forsyte.at/FMCAD19/student-forum/.

[8] P. Schrammel, "The FMCAD 2020 student forum," in *2020 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2020, p. 1, https://fmcad.forsyte.at/FMCAD20/student-forum/.

[9] M. Santolucito, "The FMCAD 2021 student forum," in *2021 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2021, p. 1, https://fmcad.org/FMCAD21/student_forum/.

[10] M. Preiner, "The FMCAD 2022 student forum," in *2022 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2022, pp. 5–6, https://fmcad.org/FMCAD22/student_forum/.

[11] M. Janota and N. Narodytska, "The FMCAD 2023 student forum," in *2023 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2023, pp. 1–2, https://fmcad.org/FMCAD23/student_forum/.

[12] M. Blicha and N. Tsiskaridze, "The FMCAD 2024 student forum," in *2024 Formal Methods in Computer–Aided Design (FMCAD)*. IEEE, 2024, pp. 5–6, https://fmcad.org/FMCAD24/student_forum/.