

The FMCAD 2015 Graduate Student Forum

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Abstract—The FMCAD Student Forum provides a platform for graduate students at any career stage to introduce their research to the wider Formal Methods community, and solicit feedback. In 2015, the event took place in Austin, Texas, as integral part of the FMCAD conference. Sixteen students were invited to give a short talk and present a poster illustrating their work. The presentations covered a broad range of topics in the field of verification, such as automated reasoning, model checking of hardware, software, as well as hybrid systems, verification of concurrent programs, and checking of security properties.

Since 2013, the FMCAD conference features a Student Forum, providing a platform for graduate students at any career stage to introduce their research to the wider Formal Methods community. The FMCAD 2015 Graduate Student Forum follows the tradition of its predecessors, which took place in Lausanne, Switzerland in 2014 [1] and in Portland, Oregon, USA in 2013 [2].

Graduate students were invited to submit short reports describing their ongoing research in the scope of the FMCAD conference. We received 21 submissions, covering novel technical contributions and outlining future research planned by the authors. The presentations covered a broad range of topics in the field of verification, such as automated reasoning, model checking of hardware, software, as well as hybrid systems, verification of concurrent programs, and checking of security properties. While all contributions were of high quality, the limitations of the venue and conference schedule forced us to reject some of the submissions. Based on the reviews provided by members of the organizing committee as well as a number of external reviewers, 16 submissions were finally accepted. The reviews focused on the novelty of the work, the technical maturity of the submission, and the quality and soundness of the presentation. The following contributions have been accepted:

- Konstantinos Athanasiou: *A Constraint-Based Approach to Multi-Threaded Program Location Reachability*
- Peter Backeman and Aleksandar Zeljic: *Approximations for Deciding Quantified Floating-Point Constraints*
- Cuong Chau: *ACL2(r) Formalization of Fourier Series' Properties*
- Shaobo He: *Towards Automated Differential Program Verification For Approximate Computing*
- Egor Karpenkov and David Monniaux: *Program Analysis with Local Policy Iteration*
- Guy Katz and David Harel: *Concurrency Idioms and their Effect on Program Analysis*
- Shou-Pon Lin and Nicholas Maxemchuk: *Probabilistic Model Checking of Systems with a Large State Space: A Stratified Approach*
- Rajdeep Mukherjee: *How Efficient are Software Verifiers for Hardwares?*
- Luan Nguyen and Taylor T Johnson: *Towards Bounded Model Checking for Timed and Hybrid Automata with a Quantified Encoding*
- Daniel Poetzl: *Efficient Checking of Thread Refinement*
- Moritz Sinn: *Bound Analysis of Heap-Manipulating Programs*
- Pramod Subramanyan: *Specification and Scalable Verification of Security Properties in Contemporary SoCs*
- Jiaqi Tan, Rajeev Gandhi and Priya Narasimhan: *White-box Software Isolation with Fully Automated Black-box Proofs*
- Danilo Vendramineto: *Exploiting Craig Interpolants in Unbounded Model Checking of Hardware Designs*
- Vadim Zaliva and Franz Franchetti: *Formal Verification of HCOL Rewriting*
- Lu Zhang: *Classifying Race Conditions in Web Applications*

The 2015 student forum is also the first in the series to feature a Best Contribution Award (based on the quality of the submission, the poster, and the presentation), announced during the conference and publicized on the FMCAD website.¹

The Student Forum would not have been possible without the excellent contributions of the student authors. The generous support of the National Science Foundation and FMCAD's sponsors enabled us to subsidize the travel cost of the participating students. The help and advice of Thomas Wahl and Ruzica Piskac, who organized the first two student forums, as well as Roope Kaivola and Shilpi Goel, who took care of all local arrangements, was crucial to the success of the event. We are also indebted to Ezio Bartocci and Vijay D'Silva for their help with the reviews.

REFERENCES

- [1] R. Piskac, "The FMCAD 2014 graduate student forum," in *Formal Methods in Computer-Aided Design (FMCAD)*. IEEE, 2014, p. 13.
- [2] T. Wahl, "The FMCAD graduate student forum," in *Formal Methods in Computer-Aided Design (FMCAD)*. IEEE, 2013, pp. 16–17.

¹<http://www.cs.utexas.edu/users/hunt/FMCAD/FMCAD15/>