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The FMCAD 2016 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 2016, the event took place in Mountain View, California, as integral part of the FMCAD conference. Ten 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 and synthesis, including automated reasoning, model checking of hardware, software, as well as hybrid systems, verification and synthesis of networks, and application of artificial intelligence techniques to circuit design.

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 2016 Graduate Student Forum follows the tradition of its predecessors, which took place in Austin, Texas, USA in 2015 [1], in Lausanne, Switzerland in 2014 [2] and in Portland, Oregon, USA in 2013 [3].

Graduate students were invited to submit short reports describing their ongoing research in the scope of the FMCAD conference. The submissions to the forum presented novel technical contributions and outlining future research planned by the authors. The presentations covered a broad range of topics in the field of verification and synthesis, including automated reasoning, model checking of hardware, software, as well as hybrid systems, verification and synthesis of networks, and application of artificial intelligence techniques to circuit design. Based on the reviews provided by members of the organizing committee as well as a number of external reviewers, 10 submissions were 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:

- Elaheh Ghassabani, Michael W. Whalen, Andrew Gacek, Rockwell Collins: "Inductive Validity Cores for Formal Verification"
- Yu-Yun Dai, Robert Brayton: "Circuit Recognition with Convolutional Neural Networks"
- Bo-Yuan Hunag, Pramod Subramanyan, Sharad Malik, Sayak Ray, Hareesh Khattri, Jason Fung, Abhranil Maiti: "Instruction-Level Abstraction Based SoC Firmware Verification"
- William Hallahan, Ruzica Piskac, Ennan Zhai, Avi Silberschatz: "Automated Firewall Repair with Example Synthesis"
- Hongce Zhang, Sharad Malik: "Equivalence Checking Using the Intermediate Instruction-Level Abstraction"
- Baoluo Meng: "Solving Relational Constraints with Extensions to a Theory of Finite Set in SMT"
- Mark Santolucito, Ruzica Piskac: "Version Space Learning for Verification on Temporal Differentials"
- Jaideep Ramachandran: "Precise Arithmetic Reasoning using Approximate Solvers"
- Rohit Dureja, Kristin Rozier: "Comparative Safety Analysis of Wireless Communication Networks in Avionics"
- Andres Noetzli: "Proofs for Preprocessing in SMT Solvers"

The 2016 student forum is the second 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]

For the first time in the student forum series, we used a voting system to choose the best contribution. We allowed any participant (other than the authors and their supervisors) to vote for a single contribution. We created an electronic voting system and provided a link to the system in the registration packages of participants. Such a system offered several advantages. First of all, it inspired the poster presenters to do their best possible presentations for any participant, not only the referees who have a voice in determining the best contributions. Second, to increase the number of votes, the students were motivated to talk to more people and to try to attract their attentions to their posters. The overall experience was overwhelming in a more interactive poster session with more attendants.

REFERENCES

[1] G. Weissenbacher, "The FMCAD 2015 graduate student forum," in Formal Methods in Computer-Aided Design (FMCAD). IEEE, 2015, p. 8.
[2] R. Piskac, "The FMCAD 2014 graduate student forum," in Formal Methods in Computer-Aided Design (FMCAD). IEEE, 2014, p. 13.
[3] 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/FMCAD16/