Invited Talk: SAT Reasoning in CDCL(T) Solvers

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Abstract

In our recent work we introduced an extension for the IPASIR interface of incremental SAT solvers. This extension, named IPASIR-UP, supports continuous interactions with the solver during SAT reasoning, allowing SMT solvers to seamlessly integrate any IPASIR-UP-compatible SAT solver as their core engine. While IPASIR-UP enables crucial interactions between SAT and theory solvers, the full potential of modern incremental SAT features, such as advanced inprocessing techniques, comprehensive proof production, and diverse search heuristics, remains largely untapped within this framework. In this talk, I presented the current landscape of embedding SAT solvers into SMT solvers via IPASIR-UP. I highlighted the currently supported features, discussed their limitations, and presented some open problems and challenges that need to be addressed in the future.

This talk is based on joint work with Aina Niemetz, Mathias Preiner, Markus Kirchweger, Stefan Szeider, Mathias Fleury, Florian Pollitt, and Armin Biere [1, 2, 3, 4].

Declaration on Generative AI

During the preparation of this abstract, the author used DeepL for grammar and spell-checking. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the publication's content.

References

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