Context-based Model Checking using SMT-solvers

Proposer(s)/Proposatzailea(k):

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Description/Deskribapena:

Model checking [1] refers to the following problem: Given a model of a system, automatically check whether this model meets a given property. When the model and the property are temporal formulas it is called symbolic model checking. We propose a new idea for the implementation of symbolic model checking using two technologies: SMT-solvers and temporal tableaux.

Goals/Helburuak:

Our aim is to implement an efficient symbolic model checker following the algorithm of [3]. This algorithm is based on one introduced in [2], but specializes in model checking with the help of SMT-solvers.

Requirements/Betebeharrak:

Knowledge of logic, automatic reasoning techniques, software development, and programming.

Tasks and plan/Atazak eta plana:

Algorithm analysis; design; implementation; and testing.

References

[1] Christel Baier and Joost-Pieter Katoen. *Principles of Model Checking* The MIT Press, 2008.

[2] Joxe Gaintzarain, Montserrat Hermo, Paqui Lucio, Marisa Navarro, and Fernando Orejas. *Dual systems of tableaux and sequents for PLTL.* Journal of Logic and Algebraic Programming 78(8):701–722, 2009.

[3] Alex Abuin, Unai Diaz de Cerio, Montserrat Hermo, and Paqui Lucio, *Context-based Model Checking using SMT-solvers.* Proceedings XVIII Jornadas sobre Programación y Lenguajes (PROLE 2018).