

Experience with implementing a model-checking algorithm based on Presburger Arithmetic

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In this talk, we will discuss the challenges with implementing the model-checking algorithm for Duration Calculus by Fränzle&Hansen, where the model-checking problem is reduced to checking satisfiability of formulas of Presburger Arithmetic.

The generated Presburger formulas have a rich Boolean structure, many quantifiers and quantifier alternations, which causes severe challenges when checking for satisfiability. In the talk we will present techniques used to simplify formulas. Furthermore, we investigate multicore parallelism in the context of functional programming (using F#) by means of quantifier-elimination procedures for Presburger Arithmetic.