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MADALGO seminar by Martin Šmérek, Masaryk University

I/O-efficient Symbolic Model Checking

Abstract:

Model checking is a popular approach for formal verification of reactive systems. However, usage of this method is limited by so-called state space explosion. One way to cope with this problem is to represent the model and the state space symbolically by using Binary Decision Diagrams (BDDs). Unfortunately, during the computation the BDD can become too large to fit into the available main memory and it becomes essential to minimize the number of I/O operations.

In this presentation, we will first talk about model checking and related problems in general. After that we will give a short introduction to BDDs and we will discuss their usage in symbolic model checking. Finally, we will briefly mention previous work on I/O-efficient BDD manipulation and we will talk about our research in this area. We will present general idea of our new vector existential quantification algorithm which is the first I/O-efficient algorithm to solve this or similarly complex problem connected to BDDs.

Joint work with: Luboš Brim