

Model Checking

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Computerized systems dominate almost every aspect of our lives and their correct behavior is essential. *Model checking* is an automated verification technique for checking whether a given system satisfies a desired property. Unlike testing or simulation based verification, model checking tools are exhaustive in the sense that they traverse *all* behaviors of the system, and either confirm that the system behaves correctly or present a *counterexample*.

Model checking has been successfully applied to verifying hardware and software systems. However, with the rapid increase in size, complexity, and versatility of computerized systems, there is a constant need for a similar increase in verification capabilities.

In these lectures we will survey different model checking techniques which can improve model checking applicability in different ways. We will start from the old fashioned techniques of BDD-based Symbolic Model Checking and SAT-based Bounded Model Checking. We will then proceed to using interpolation and interpolation sequence for SAT-based model checking. We will discuss abstraction in model checking. If time permits we will also present finite automata over infinite alphabet.

References

- [1] E.M. Clarke, O. Grumberg, D. Peled. *Model Checking* MIT Press, 2000.