Proof Search in Modal Logic: Looking Forward

Daniel Pomerantz

Supervised by Brigitte Pientka

Abstract

Modal logic allows us to distinguish between possibility of truth and necessity of truth. It has many uses in computer science in fields such as network security. In this talk, I will discuss some of the issues involved in automating a proof search, focusing on those that occur in forward search.

In forward search, we wish to start from our assumptions and apply logical rules in order to reach our goal. While every statement we generate is provable using this approach, unfortunately there are too many true statements to make this technique feasible. To restrict the search space and the number of statements we generate, we have proven several properties about our logical system. Based on these theoretical ideas, we designed and implemented a prototype theorem prover to gain an understanding of their impact in practice. We will describe what we have done so far and discuss future work.