

# Caching in Backtracking Search

Fahiem Bacchus

University of Toronto  
Canada

`fbacchus@cs.toronto.edu`

As backtracking search explores paths in its search tree it makes various inferences about the problem. The inferences search computes can be very computationally expensive to compute statically. However, in most backtracking CSP solvers this information is discarded when the search backtracks along the current path.

In this talk we will investigate the alternative—caching these inferences and using them to improve the efficiency of the rest of the search. Caching provides radical improvements to the theoretical power of backtracking, and can also yield significant improvements in practice. Sometimes, however, obtaining improvements in practice might not be so straightforward. We will examine CSP caching techniques for the problem of finding a single solution, counting the number of solutions, and finding an optimal solution. Time permitting we will also look at caching techniques that would be useful for QCSPs.