

# Abstract

Constraint satisfaction is a paradigm naturally suited to solving many types of complex combinatorial problem. One of the great attractions to research in this area has been the high rate of transfer of constraint based technology to commercially viable products. This has resulted in many successful applications.

The success of constraint based technology has resulted in a considerable amount of research effort aimed at producing ever more effective and efficient ways of tackling constraint satisfaction problems. It has now become a vast field. However, one facet of constraint satisfaction which has remained largely neglected to date is perhaps the most fundamental of all - how to effectively formulate a given problem as a constraint satisfaction problem.

Problem formulation is an extremely important part of problem solving. The choice of a good formulation can result in order of magnitude savings in search cost. Conversely, if a bad formulation is adopted, we can experience order of magnitude increases in search cost. In this thesis we address the issue of problem formulation and how to traverse the space of possible alternatives in a systematic and effective manner. The result of our work is a heuristic approach which represents a significant step towards that goal.