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## Abstracts

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### Why Some Chunks are Expensive

Milind Tambe, Allen Newell  
CMU-CS-88-103, April 1988

Soar is an attempt to realize a set of hypothesis on the nature of general intelligence within a single system. One central hypothesis is that chunking, a simple experience-based learning mechanism, can form the basis for a general learning mechanism. It is already well established that the addition of chunks improves the performance in Soar a great deal, when viewed in terms of subproblems required and number of steps within a subproblem. But this high level view does not take into account potential offsetting costs that arise from various computational effects. This paper is an investigation into the computational effects of expensive chunks. These chunks add significantly to the time per step by being individually expensive. We decompose the causes of expensive chunks into three components and identify the features of the task environment that give rise to them. We then discuss the implications of the existence of expensive chunks for a complete implementation of Soar.

### Pattern Knowledge and Search:

#### The SUPREM Architecture

Hans Berliner, Carl Ebeling  
CMU-CS-88-109, April 1988

We present a new problem solving architecture based upon extremely fast search and pattern recognition. This architecture, which we have named SUPREM, has been implemented in the class machine/program HITECH, and has proven to be very successful. We describe the implementation in HITECH and the reasons for its success, and compare the SUPREM architecture to other well known problem solving architectures.

Certain interesting phenomena have become exposed as the result of our work with HITECH. The most important of these is that: "The further a process can look ahead, the less detailed knowledge it needs." We have also found that patterns can be formulated for quite complex problems in relatively small pattern