Chapter 6: RESULTS AND DISCUSSIONS

Section 6.1: Results in the machine learning domain:

The integrated machine learning system SRISHTI, provides a solution based on a theory of learning to the learning strategy selection problem. This approach solves the strategy selection problem unambiguously, as demonstrated in the application to the Towers of Hanoi puzzle. The system was able to learn all the moves required to solve the Towers of Hanoi puzzle in three to five runs (The variance in the number of runs is due to variance in expertise in the users). The system was also able to acquire details of the problem environment. This was demonstrated through the learning of the rule that, one cannot put a bigger disk on top of a smaller one. Through the application of the learning by observation and discovery strategy the system also discovered that N-1 disks have to be necessarily moved to the free peg (In the problem implemented, which used four disks per peg, this meant that first, disks one, two and three had to be moved to peg 2). This demonstrated the first step towards learning the concept of recursion.
The system was also able to successfully apply its machine learning strategies to learning (or mis-learning) concepts in the domain of multi-digit-subtraction.

Section 6.2: Results in the ITS domain:

Student modelling, in the domain of multi-digit-subtraction, through the use of SRISHTI's theory of learning has demonstrated an explanatory and generative (off-line) theory of the genesis of bugs. Bugs have been related to misapplication of learning strategies.

A theoretical framework was presented for extending this theory to the domain of Form design.

Section 6.3: Discussions:

Section 6.3.1 Limitations from a Machine learning perspective:

SRISHTI is built around the mapping procedure. This is currently hand-coded and forms the major limitation. The procedures of the learning strategies are also hand-coded to suit the representations used in the particular environment. (The theory of learning knowledge base, contains a general scheme for each of the procedures of the learning strategies which can be consulted to check correctness of the procedures implemented.)
Section 6.3.2 Limitations from an ITS perspective:

Constraints imposed by natural language processing made it not possible to implement the SRISHTI based ITS for the domain of Engineering design.