

# **The Scheduling Problem in Learning from Hints**

**Zehra Cataltepe**

M.Sc. Thesis, California Institute of Technology, Computer Science Department, 1994

## **Abstract**

Any information about the function to be learned is called a hint. Learning from hints is a generalization of learning from examples. In this paradigm, hints are expressed by their examples and then taught to a learning-from-examples system. In general, using other hints in additions to the examples of the function improves the generalization performance.

The scheduling problem in learning from hints is deciding which hint to teach at which time during training. Over- or under-emphasizing a hint may render it useless, making scheduling very important. Fixed and adaptive schedules are two types of schedules that are discussed.

Adaptive minimization is a general adaptive schedule that uses an estimate of generalization error in terms of errors on hints. When such an estimate is available, it can also be optimized by means of directly descending on it. An estimate may be used to decide on when to stop training, too.

A method to find an estimate incorporating the errors on invariance hints, and simulation results on this estimate, are presented. Two computer programs that provide a learning-from-hint environment and improvements on them are discussed.