Chapter 3 [1]

AN INCREMENTAL LEARNING ALGORITHM FOR INFERRING LOGICAL RULES FROM EXAMPLES IN THE FRAMEWORK OF THE COMMON REASONING PROCESS

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Abstract: In this chapter we present a model of common sense reasoning that combines a pattern recognition and learning of logical rules from examples. The class of rules is implicative but these rules can be represented in different forms. The model of knowledge base and an example of the reasoning process based on knowledge are considered. An approach is proposed for inferring implicative logical rules from examples. The concept of a good diagnostic test for a given set of positive examples lies in the basis of this approach. The process of inferring good diagnostic tests is considered as a process of inductive common sense reasoning. The incremental approach to learning algorithms allows revealing the interdependence between two fundamental components of human thinking: pattern recognition (deductive inference) and knowledge acquisition (inductive inference).

Key Words: Incremental and Non-Incremental Learning, Learning from Examples, Machine Learning, Common Sense Reasoning, Inductive Inference, Good Diagnostic Test, Lattice Theory.

[1] Triantaphyllou, E. and G. Felici (Eds.), **Data Mining and Knowledge Discovery Approaches Based on Rule Induction Techniques**, Massive Computing Series, Springer, Heidelberg, Germany, pp. 89-147, 2006.