Computational Cognition of Spatial Objects

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Abstract: Our research aims at developing a computational system to model human cognition of spatial objects and human strategies to acquire and reason on knowledge about spatial environments. Spatial cognition differs among people and situations and is highly influenced by the context in which an object is perceived. Gestalt-Psychology postulates that we experience things as an integral, meaningful whole, which is more than just the sum of its parts. A computational model which is intended to reflect human cognition must be flexible enough to adapt a representation of primitive elements and produce a structured representation of the spatial object reflecting the perception of the meaningful whole. We investigate experimentally how humans perceive sketches typically hand-written line drawings of real-world spatial objects and apply these findings to develop an intelligent model for computational cognition of spatial objects. Deductive, inductive and analogical learning techniques form the basic reasoning mechanisms of our system.