

Agent-Based Engineering Drawing Analysis

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Abstract

Interpretation of paper drawings has received a good deal of attention over the last decade. Related areas such as direct interpretation of human drawings (HCI), search and indexing of graphics databases, and knowledge representation in the domain of graphics and drawing understanding have also seen advances.. One of the most interesting applications in this domain is the analysis of semantics in engineering drawings.

Although several sophisticated automatic systems have been developed, for example, the CELESSTIN system in France, there are still significant problems in their application: (1) they are linear and do not allow backtracking solutions, (2) they are typically flat rule-based systems with many rules, and (3) the knowledge models are embedded directly in the rules and are unavailable in a higher-level form. We still need a more automatic, self-contained, less complex and robust system involving minimal human intervention. The use of autonomous agents in the field of image analysis is just starting.

Our thesis is that a set of nondeterministic agents provides the necessary methodology to address the shortcomings of previous systems. We explore the organization, communication and high-level knowledge representation of a set of agents designed to perform engineering drawing analysis. This permits the exploration of interesting parts of the search space, especially when combined with good pruning and focus mechanisms.