

Explicit and Persistent Knowledge in Engineering Drawing Analysis

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UUCS-03-018

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October 10, 2003

Abstract

Domain knowledge permeates all aspects of the engineering drawing analysis process, including understanding the physical processes operating on the medium (i.e., paper), the image analysis techniques, and the interpretation semantics of the structural layout and contents of the drawing. Additionally, an understanding of the broader reverse engineering context, within which the drawing analysis takes place, should be exploited. Thus as part of a wider project on the reverse engineering of legacy systems, we have developed an agent-based engineering analysis system called NDAS (nonDeterministic Agent System).

In this paper, we discuss the nature of such a system and how knowledge can be made explicit (both for agents and humans) and how performance models can be defined, calibrated, monitored, and improved over time through the use of persistent knowledge. A framework is proposed that allows computational agents to: (1) explore the threshold space for an optimal analysis of the drawing, (2) control information gain through agent invocation, (3) incorporate and communicate knowledge, and (4) inform the software engineering and system development with deep knowledge of the relationships between modules and their parameters (at least in a statistical sense).