Visualizing and Understanding Diagnoses
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National Research Council Canada   Conseil national de recherches Canada

Canada

Visualizing and Understanding Diagnoses [1,2]

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Summary

Diagnosis of physical systems such as car or aircraft engines is a complex activity. Technicians combine textual manuals with schematics and some analysis of measured data to diagnose and repair engines. Knowledge-based system designers have added heuristics to link text and graphic (hypermedia) representations of manuals to simplify the tasks of the technicians as implemented in JETA [Halasz91]. Knowledge browsers are used by the developers of such systems to structure and input the knowledge base and are also used in a limited capacity to help the domain experts visualize the knowledge and the various possible relations. Such a browser has been implemented to view and edit JETA's knowledge. In RATIONALE, a diagnostic system that reasons by explaining, explanation is used to understand system reasoning [Abu-Hakima90]. This paper argues that although these knowledge-based approaches help in the visualization and understanding of diagnoses in physical systems, they need to be improved and better integrated into an overall diagnostic environment. Some of the many issues that arise in trying to achieve this are discussed in the paper.

Introduction

Diagnosis of physical systems such as car or aircraft engines is a complex activity. Technicians combine paper manuals with schematics and some analysis of measured data to diagnose and repair engines. Knowledge-based systems provide the technicians with electronic manuals organized using hypermedia techniques as well as diagnostic hierarchies that represent the failure, test and repair actions of the diagnostic cycle. Such an approach has been followed for JETA, the Jet Engine Troubleshooting Assistant [Halasz91]. Other systems have followed modelling and simulation techniques that represent the actual physical system and attempt to diag-

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1. NRC document 33220.
2. Based on a paper published in the AAAI '92 workshop proceedings on Communicating Scientific and Technical Knowledge.

1