

## Referation Search: A New Method of Intelligent Information Retrieval

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Today's database system is required to retrieve intelligent results. To realize it, many attempts have been done from two viewpoints. One is to create the new knowledge base, and the other is to add additional data to the existing database. This demonstration is an example of the latter one. A feasible system of intelligent retrieval based on referation database is developed on a microcomputer. As simple and objective data which represent the relationships between documents, a reference code is inputted with the aid of the author's index. Referation defined as merging citing one, cited one, and document itself, is the base of this new information retrieval system. By referation search, we are able to retrieve the related and ranked results to the query key. The associated ones, however, do not have the query key necessarily. And further these results contain not only documents, but also keywords, authors, and sources. A user friendly environment of information retrieval is demonstrated using colored and graphical display, too.

## Machine Understanding of Diagrammatic Material to Automate the Building of Full Document Databases

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As part of our long-term project to build fully parsed whole document databases, we are developing an intelligent system to parse diagrams. Diagrams are a critical part of documents. A great deal of effort has been expended to develop systems that generate diagrams, but little effort has been spent on developing methodology or systems that can understand or parse diagrams. Unless this is done, databases will contain, at most, unstructured, raw pictures which will not lend themselves to classification or retrieval other than by hand.

The Diagram Parsing System (DPS) we are developing is designed to take an XY data plot, discover the axes and their labels, the numerical scales, and the data itself. Its output is a structure representing the text and data of the plot in a standard form suitable for inclusion in a database, for a Q/A system, or for knowledge-based AI applications. DPS uses a blackboard strategy implemented in an object-oriented style, merging the traditionally separate knowledge sources and data. Its focus-of-attention strategy is to restrict processing to a limited 2D region, guided by "peripheral" information which is less detailed -- much in the way that humans scan a visual scene.

DPS is built in Common Lisp and New Flavors on a Symbolics system under Genera 7. It takes advantage of the bit-mapped display to demonstrate the progress of the parsing.

## Demonstration Prototype for Reference Service: The ESIE Expert System


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ESIE, an expert system shell by Lightwave Inc., runs several modules which model the decision-making process of expert reference librarians. Simulating the reference interview by asking a series of questions, the system selects the appropriate reference format such as dictionaries or encyclopedias from a variety of possible formats. Invoking another module leads the reference librarian or user to a specific source which contains the answer to the user's question.


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