ACM 82 PANEL SESSION

ADVANCES IN INFORMATION RETRIEVAL

SESSION CHAIRPERSON
Donald H. Kraft
Department of Computer Science
Louisiana State University
Baton Rouge, LA 70803

SESSION OVERVIEW: The objective of this panel, which is sponsored by ACM/SIGIR, is to present a series of state-of-the-art work on information retrieval. Brief presentations (twenty minutes) by the panelists on their research will be followed by a question and answer period inviting audience participation on the future of information retrieval research.

PANEL PRESENTATIONS:

- Extended Boolean Information Systems
  Gerard Salton, Cornell University

  ABSTRACT:
  In conventional information retrieval Boolean combinations of index terms are used to formulate the users' information request. Boolean queries are difficult to generate and the retrieved items are not presented to the user in any useful order. A new flexible retrieval system is described which makes it possible to relax the strict conditions of Boolean query logic thereby retrieving useful items that are rejected in a conventional retrieval situation. The query structure inherent in the Boolean system is preserved, while at the same time weighted terms may be incorporated into both queries and stored documents; the retrieved output can also be ranked in strict similarity order with the user queries. A conventional retrieval system can be modified to make use of the flexible metric system. Laboratory tests indicate that the extended system produces better retrieval output than conventional Boolean or vector processing systems.

- An Information Retrieval Perspective on Fuzzy Database Systems
  Bill P. Buckles, University of Texas at Arlington

  ABSTRACT:
  Database in which domain values are not crisp and precise exhibit properties normally associated with information retrieval systems. For instance, a boolean query induces a membership value for each tuple (i.e., record) that is analogous in function to a similarity measure. Thus, precision and recall measures are legitimate areas of interest that pertain to fuzzy databases but not ordinary databases. These ideas will be expounded in the context of a database for expert advice on national energy policies.

- Generalizations of Boolean Query Processing
  Donald H. Kraft, Louisiana State University

  ABSTRACT:
  Substantial work has been done recently applying fuzzy subset theory to the problems of document and query representation and processing in retrieval systems. The motivation has often been to generalize Boolean query processing to allow for non-Boolean index weights or measures of importance to be attached to the individual terms in the document or in the query representation. The problems of generalizing the Boolean lattice structure have been noted. Criteria have been generated for query processing mechanisms with relevance weights in the query, but these have been shown to be inconsistent. An alternative approach using thresholds in the query has been suggested, with the generation of appropriate document evaluation criteria for Boolean query processing.

  Problems remain unsolved. The exact form of the function to be used for the query processing mechanisms must still

be specified and appropriate parameters must be obtained. Some researchers still prefer a vector space approach, others suggest alternatives to Boolean queries, others work on probabilistic approaches, and still others propose new lattice structures for weighted retrieval. These various models must be reconciled with each other and with an overall generalization that encompasses each and allows for analysis and comparison. Moreover, evaluation mechanisms must be sought for fuzzy systems, and it is necessary to generate a fuzzy concept to the notion of "retrieval" itself.

- Implications of Artificial Intelligence for Information Retrieval
  Nicholas V. Findler, Arizona State University

- Session Reactor:
  Robert R. Korfhage, Southern Methodist University