



Intelligent Assistance for Complex Systems

Tom Kehler, Avron Barr, Tim Finin, Peter Friedland, Mike Genesereth,
Jim Miller, Mark Miller, Elliot Soloway, Harry Tennant

Complex systems are becoming more pervasive, yet in order for these systems to be used effectively, machine-based assistance is needed. With the advent of powerful personal systems it is anticipated that experts in various disciplines will become increasingly dependent on computational environments provided they are given a means of exploiting system capabilities.

Traditional help systems have made use of canned text which is presented in response to typing a "?" or "help". Many integral help systems embed canned hints at appropriate places in the program. Help is commonly provided via a scheme for accessing text files. Help files may be indexed by names such as MAIL, EDIT, LOGIN. Indexing of files is sometimes extended by permitting the user to type a sequence of words such as HELP MAIL READ to provide assistance on subcategories of a topic. Canned text can also be accessed hierarchically through use of a menu system. Most traditional help systems use one of the techniques described to provide assistance.

While text-based help systems can improve the user interface, they lack an ability to respond to the user's need. The problem with traditional help systems is that there is often a conceptual mismatch between the user's problem and the assistance offered by the system. The user may have difficulty formulating a request. If the user has a clear understanding of the information they want, matching their request to the system designer's indexing scheme can be difficult. Further, the assistance provided by the system may not be appropriate for the user's problem. Canned text systems do not comprehend the problem solving context and thus flexibility of the system is restricted.

Application of artificial intelligence (AI) technology to user assistance has demonstrated potential for producing systems which are more effective in aiding users. AI technology includes computational methods used to model, emulate and interact with human problem solving behavior. Applied to user assistance, this includes techniques for modeling and analyzing user's plans, modeling the methods and facts associated with a particular domain of expertise as well as modeling pedagogical strategies for providing appropriate assistance to the user.

Members of the panel have had experience with constructing help systems, programming tutors, and system advisors using AI techniques. Issues in constructing integral help systems based on AI techniques will be discussed by the panel. The panel participants are listed below with their affiliation and the particular system they have developed:

Tom Kehler, Ph.D., Vice President and Director of Applied Artificial Intelligence at IntelliGenetics, Palo Alto, California. System experience: HELPME, a system using multiple interfaces to text to provide help.

Avron Barr, Stanford University. System experience: BIP (the Basic Instruction Program) a tutorial system for the BASIC programming language.

Tim Finin, Ph.D., Assistant Professor of Computer and Information Sciences, University of Pennsylvania, Philadelphia, Pennsylvania. System experience: WIZARD, a help system for the VAX which uses plan recognition to aid the user.

Peter Friedland, Ph.D., Research Associate, Stanford University. System experience: UNITS, a knowledge acquisition system for domain experts.

Mike Genesereth, Ph.D., Assistant Professor, Stanford University. System experience: MACSYMA Advisor for symbolic mathematics.

Mark Miller, Ph.D., Executive Vice President, Computer Thought, Plano, Texas. System experience: SPADE, a programming tutor for the programming language LOGO.

Jim Miller, Ph.D. Texas Instruments, Dallas, Texas. System experience: a "kibitzer" for text editing.

Elliot Soloway, Ph.D. Assistant Professor, Yale University, New Haven, Connecticut. System experience: MENO, a programming tutor for PASCAL.

Harry Tennant, Ph.D., Manager of Artificial Intelligence Research, Texas Instruments. System experience: Evaluation of effective natural language interfaces.