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ADVANCED IMPLEMENTATION METHODS FACILITY

Work Zone Traffic Control Interactive Videodisk Training

The delivery system for any new technology is an essential element in the acceptance and success of that new technology in the highway community. The Advanced Implementation Methods Facility develops and evaluates new technology transfer delivery systems.

Why do we need the Advanced Implementation Methods Facility ?

o To advance the state of knowledge of information storage, retrieval, and evaluation systems and to transfer and share highway related knowledge.

o To timely integrate expert systems technology into the highway community with training, guidance, and support.

o To develop and promote computer aided training concepts, including interactive videodisk training.

What has been accomplished so far ?

o Management and planning guidelines for the development of expert systems - Chapter X, "Expert Systems," FHWA Information Resources Management Manual.

o Technical guidelines for the development of expert systems.

o Initial evaluation of a Computer-Aided Structural Analysis/Graphical Interactive Finite Element Total System that was adopted as an evaluation tool for complex bridge structures.

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INTRODUCTION

The Advanced Implementation Methods (AIM) Facility, located at FHWA's Turner-Fairbank Highway Research Center in McLean, Virginia, was created to provide an environment for the development of more efficient methods and timely technology transfer delivery systems. Included in the goals are development, evaluation, and application of computer-aided training, interactive videodisc training, expert systems, information systems, and other products and services to support the timely and efficient transfer of new technologies.

CURRENT ACTIVITIES

Expert systems are computer programs that contain a simulation of the reasoning or problem solving processes of human experts. These programs have great potential as decision aids, advisors, and training aids. More than 15 States are planning and over 30 other organizations have proposed highway related expert system developments. Since expert systems are in their infancy, centralized coordination and setting of standards are needed to avoid duplicative efforts.

The AIM Facility has established a viable expert system evaluation and support program for FHWA, prepared a management and planning guide that constitutes Chapter X of the FHWA Information Resources Management Manual, and prepared a technical guide for expert systems development. These materials are available to Federal agencies, States, universities, and other interested parties.

In conjunction with the University of Maryland, the AIM Facility is developing an Expert System for Maintenance Management of Flexible Pavements. This system will assist the highway engineer with flexible pavement evaluation as it generates a set of maintenance and rehabilitation strategies by evaluating the overall pavement condition and determining the set of probable deterioration causes.

Interactive videodisc training has been used successfully in other professions (education, military, and medical). However, this training method has not been utilized by the highway community. An interactive videodisc training module on work zone traffic control was developed by the RD&T Traffic Safety Research Division and is being further refined and evaluated jointly with the AIM Facility.

To develop a tool that is more effective as both a training aid and an advisor to the user, expert systems and interactive videodisc technologies are being combined in a single system. This activity builds on the work zone traffic control expert system developed by the Virginia Research Council under an HP&R program.

In another training related activity, the AIM Facility is monitoring progress on research being conducted on compressed video training. Compressed video is running a standard videotape at a faster speed to compress the viewing time. Earlier results show that for certain training applications, compressed video is more effective than a live speaker or normal video.

FUTURE ACTIVITIES

The AIM Facility will continue to be the clearinghouse for expert systems and other related new advances, such as natural language processing and machine learning, until these technologies are routinely incorporated into highway operational or managerial activities.

Electronic exchange of information offer tremendous cost savings potential for users. Information retrieval should be as easy as making "voice communication" inquiries. One goal of the AIM project is to establish simpler means for managers to obtain needed information on new technologies by the use of electronic bulletin board networking. For users, queries could be answered by the "help files" available on the bulletin boards and user forums developed by the AIM Facility.