

## Research at Penn State McKeesport focuses on human-Web interaction

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No one can argue that the Internet, Web browsers and search engines have all made a significant impact on how people function both at work and at home. Whether composing an academic paper or shopping for holiday gifts, the Internet has become the world's most widely used research vehicle.

Through research on human-computer interaction, Guangfeng Song, assistant professor of information sciences and technology at Penn State McKeesport, is working to make navigation that much easier for Web users.

A graduate of the doctoral program in industrial engineering at Purdue University, Song's dissertation was "A Method to Reuse Web Browsing Experience to Enhance Web Information Retrieval." The research focused on developing a better design for Web browsers to allow the browser to learn and merge Web-browsing experiences. This innovation would allow the computer to observe individual Web activity and to adjust to the user, making one's Internet use more personalized.

Currently, Web users are able to bookmark Web sites. Computers also can compile a history of Web sites accessed. Both bookmarks and history, however, are the result of passive action, available only because the user has fed the computer the information. Song's research focuses on action, using a learning Web browser to observe the user's behavior, analyze the data and save that experience for future and/or shared use.

Most Web users have had the experience of going onto the Internet and

discovering a Web site or Web site area of interest. Often, when trying to return to that area, the user has difficulty interacting with the Web in the manner used previously. Through the use of an active learning Web browser, the history of previous use would be turned into written instructions for future use. This type of browser memory would also make research easier as individuals could better communicate with their collaborators on how they interact with the Web.

By reviewing the individual's Web-browsing habits, how they retrieve information and where they have difficulty in the browsing process can simplify the individual's experience and lead to better Web-site design. Human beings are creatures of habit and tend to make repetitive actions even when surfing the Internet.

Song is contemplating how his research can lead to detecting similarities among Web sites. By researching human perception of Web-site design, Song hopes to discover what combination of factors leads an individual to sense Web-site similarity. Color and layout are two areas which may be contributing factors to the human perception of Web-site similarity. This perceived similarity ultimately results in better-predicted and supported-user behaviors.

As part of his research, Song also is studying the segmentation of the Web page, determining the separate and distinct parts of the Web site. The current architecture of the Web does not lend itself to effectively documenting user experience. It is Song's belief that better Web-site design will allow the computer to more easily compile written instructions on previous Web-site experience leading to advances in human-computer interaction.

Personal privacy is a major concern in the compilation of the user's Web experiences. Some feel the resolution to the problem lies with full control and responsibility of the provider for the analyzing and storage

of the user's browsing history. It also may be possible for Web users to save and/or share their browsing experiences on a voluntary basis only. This issue will certainly warrant debate and require assurances for Web users if human-computer interaction is to be implemented.

Song, along with his dissertation adviser, Gavriel Salvendy, has had two works on human-computer interaction published. "A framework for reuse of user experience in Web browsing" appeared in Behavior and Information Technology. The second article, "Effectiveness of automatic and expert generated narrative and guided instructions for task-oriented Web browsing" appeared in the International Journal of Human-Computer Studies.

Song hopes his research will lead to the power of prediction for user needs in the area of human-Web interaction. In the future, Song and his counterparts may play a role in allowing more effective use of the Internet for the individual and better collaboration and communication among all Web users.

Source: Penn State

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