

# Computer Science Colloquium

Thursday, September 30, 2010

3:30 pm – 4:45 pm

Petty Science Building, Room 217

## **Understanding Nature of Accessibility & Usability Problems Blind Users Face in Web Interactions**

Rakesh Babu

*Abstract:* The sight-centered design of information & communications technology (ICT) creates significant accessibility and usability problems for the blind in Web interactions. More than 45 million people around the world interact with computers and ICT by listening to speech output from screen-reading software. Although accessibility and usability problems are undesirable for all, they create additional challenges for the blind in completing online tasks. Current approaches address this problem through technical solutions - standardization, better interface design and improved screen-reading technology. Yet, Web accessibility and usability remain challenging for the blind. A critical limitation in existing literature is a sound understanding about the nature of problems blind users experience in Web interactions. This understanding is needed to adequately inform the development of accessibility and usability solutions. Without this, efforts to improve Web accessibility and usability for the blind will remain ineffective. Through this research, we develop this understanding.

We adopt a cognitive, user-centered, task-oriented approach that synthesizes research in human-computer interaction, problem-solving and cognitive science. We employ think-aloud method of direct observation to collect verbal protocols of blind users performing online tasks. We analyze the evidence employing verbal protocol analysis and an integrated problem-solving framework. Our results will explain (a) where and why blind users face problems completing common online tasks, (b) how each problem manifests in the mind of blind users, (c) responsible interface elements and (d) character of each problem as per accessibility and usability principles. Our research fills the knowledge gap about the nature of problems blind users face in Web interactions. This knowledge is necessary to determine Requirements for Web accessibility and usability. The mental models inform Web developers/ designers about special needs and challenges of blind users and guide them in building Web applications for non-visual interaction. Our research will provide a feasible and effective method to understand accessibility and usability problems in other types of Web applications and for other user groups with special needs.

*Bio:* Mr. Rakesh Babu is a final year PhD Student of Information Systems at the University of North Carolina at Greensboro (UNCG). He is the principal researcher & co-founder of IncludeAll - a research and innovation organization that strives to empower the visually impaired in the information society. Rakesh is blind and has strong motivation to undertake & promote research topics relevant to the welfare of the blind. His research expertise includes Web Accessibility & Usability, Human-Centered Computing, user-driven innovation, Non-Visual Interaction, & Cognitive models. His research appears in several international journals and conference proceedings. This year, he co-authored 7 publications and 6 grant proposals directly related to this topic. Three of these proposals received grants from the National Science Foundation, European Research Council and the Research Council of Norway. Rakesh has collaborated with researchers from University of Oslo (Norway), Aalborg University (Denmark), University of Muenster (Germany), Florida State University (the US), IIT Madras (India) and Infosys Technologies, and multiple organizations that serve the blind. Rakesh is a regular reviewer for journals and international conferences.