Graduate Student Consortium

Designing for Diversity in End-User Development Tools

At the 2003 Human-Centric Computing Conference, the U.S. National Science Foundation (NSF) sponsored a graduate student consortium on the theme of making programming languages and environments suitable and useful for the educationally disadvantaged. Last year, NSF sponsored a second event at VL/HCC'04, with the theme of addressing diversity issues in end user development environments. Both workshops brought together graduate students, faculty mentors, and conference attendees currently working on research related to the themes. The events produced considerable excitement and community building around approaches for reaching broad populations.

The NSF is continuing its sponsorship of this graduate student consortium in 2005. The research theme of this year’s event is: How can designers of digital devices and environments better address universal access issues? Operation of digital devices is increasingly necessary in our information society, to locate, retrieve, and manipulate information, whenever it is needed, wherever it may reside. Providing these capabilities to all people, including those who are disadvantaged by their background, education, learning style, or physical abilities, is a universal access problem. We aim to explore all aspects of universal access, with a special emphasis on multi-modal interaction. We encouraged submissions that explore interaction metaphors utilizing input methods beyond the keyboard and mouse and output methods beyond a two-dimensional display; and that investigate the roles of mobile devices such as smart phones, PDAs, or wearable computers.

Digital devices are in general created by a highly educated and privileged class of technology developers who all too frequently have little awareness of the special needs of disadvantaged populations. Without this awareness, these developers embed only their own value systems in the languages and tools they provide. We will explore ideas about how to analyze and respond to the special needs of disadvantaged populations as an integral component of the design process. As in the past, we look beyond surface-level interactions with computers to consider programming as an area of true information power. Ensuring that designers of programming languages and tools consider the needs of populations who historically have been overlooked in information technology will increase the chance that these groups are able to learn and use the more powerful tools becoming part of everyday information literacy. At the same time, such efforts may lead researchers to identify metaphors and techniques that increase the usability of their languages and environments more generally. In this context, we broadly define programming to include most types of generalized problem-solving systems, including CAD systems, spreadsheet systems, voice mail programming, systems for building macros, and multimedia/web authoring.

The student research presented at this year’s consortium broadly spans the research theme, addressing the special needs of groups such as older adults, people with cognitive or physical disabilities, artists and designers, consumers, community groups, and people in developed and developing countries worldwide. Approaches include the use of animation, visualization, music, personal digital assistants, and mobile phones. Several researchers focus on testing and developing error-free software, a particularly difficult area for end-user populations. In addition, we are pleased to have the participation of several experts whose research is relevant to the theme but who are not traditionally present at this conference. Their perspectives will help to enrich the discussions at this event.

John Pane, Graduate Student Consortium Chair, VL/HCC 2005

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