

## SIGACCESS Member Profile

*Edmund LoPresti*

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Member of SIGACCESS since: 1999

Member of ACM since: 1999

**1. How many years have you been working in this area?**

11 years.

**2. What motivates or inspires you to work in this area?**

I am motivated by a desire to improve people's quality of life, and by the challenge of developing user interfaces that meet diverse needs. I am inspired by people with disabilities who develop their own low-tech, high-tech, and no-tech solutions; and by the unmet needs that remain for many people.

**3. Please describe your current research project(s):**

Currently I am working on a number of projects which are intended to serve people with cognitive impairments due to traumatic brain injury and other disabilities. Through my company, AT Sciences, I am working on systems to provide task guidance (through a distributed system allowing clinicians and family members to coordinate with the person with a disability) and wayfinding assistance (using RFID and other sensing technologies to determine a person's location indoors). As a member of the RERC on Advancing Cognitive Technologies at the University of Colorado, I am assisting in a project to explore technology needs across the lifespan for people with cognitive impairments. As a member of the RERC on Telerehabilitation at the University of Pittsburgh, I am assisting in the development of a virtual job coach using computer vision to compare user performance with ideal task performance. This work has been undertaken with support from the US National Institutes of Health and Department of Education.

I am also working toward the development of a sensor module for collision avoidance on power and manual wheelchairs. Wheelchair users with barriers to safe driving, including spastic movements or visual impairments, will operate their wheelchairs normally; but a network of low-cost ultrasound and infrared sensors will monitor the environment for obstacles, and over-ride the wheelchair controls to prevent collisions. Prototype wheelchairs have met performance criteria for obstacle avoidance when driven by individuals without disabilities, or autonomously moving about a room. Prototypes have also been successfully driven through a test course by individuals with visual impairments, and through a school setting by a novice wheelchair user with spastic movements. This work has been performed in conjunction with the University of Pittsburgh, with support from the National Institutes of Health.

In conjunction with Koester Performance Research, I am working on a software agent to adapt user interface settings (such as mouse sensitivity, keyboard repeat rate, and scan rate) for users with fine motor limitations. Preliminary research indicates that the software agent can recommend appropriate settings for double-click time and Sticky Keys. Agent-selected settings for mouse sensitivity and keyboard repeat delay have little impact for most users, but can provide significant improvement for select individuals.

**4. *What is your professional background?***

I received a Bachelor of Science in Electrical and Computer Engineering from Carnegie Mellon University in 1996, with a minor in Biomedical Engineering. I received my PhD in Bioengineering from the University of Pittsburgh in 2001.

**5. *Please describe any past projects on which you have worked:***

I have had the opportunity to see two products to which I've contributed make the transition to the marketplace. Software which I originally developed as an adaptive driver for users of head-operated computer controls is now available (with substantial alterations) as the PointSmart driver from Infogrip (<http://www.infogrip.com>). I've also contributed to Compass (<http://www.kpronline.com>), software which can provide quantitative measures of computer access skills in order to assist in assistive technology recommendations and outcomes measurement.

**6. *Have you participated in any SIGACCESS-sponsored event?***

I first participated in the ASSETS conference in 2000, when I presented a paper on head-operated computer controls and was honoured to receive the Best Student Paper award. Since then I have presented demos (of computer skills evaluation software in 2002, and task guidance software for people with cognitive disabilities in 2005); and participated in a panel presentation (on technology for people with cognitive disabilities, in 2002). I was also a member of the 2005 Program Committee, a role I will continue in 2006.

**7. *What else would you like to see SIGACCESS do?***

I would like to see coordination between SIGACCESS and the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), and possibly other societies in the field. Areas of coordination could include dissemination of knowledge in the field, and influencing government policy.