## SPARC: Slideshow Presentation Access with Real-time Communication  ID: 4020
Featured Innovators: Hyun Ka, PhD

Presentation software, such as Microsoft Powerpoint, has been a primary way to communicate information to participants in many different settings, including education, business, governments, religion, entertainment, and so on. However, persons with blindness or visual impairments find it difficult or impossible to access the slideshow content. Some presenters provide an alternative format of their presentation slides in advance, so that visually-impaired audience members can read them through with a screen reader or electronic braille-reading device. Taking this burden off the presenter, SPARC is a cloud-based Powerpoint add-in that automatically provides real-time alternative access to the information displayed on a public screen.

### Technology Description
SPARC consists of 3 inter-related system components, including a SPARC presenter add-in, a SPARC cloud service, and a SPARC user terminal app. Once the slideshow starts in Microsoft Powerpoint, the presenter add-in automatically analyzes the current slide and converts it into accessible text format. Then, it publishes the converted text to the cloud service along with some metadata – including a slide number, information on slide layout, and non-textual object properties in the current slide. Whenever the presenter navigates the active presentation, the add-in automatically recognizes the event and publishes the updated information to the cloud service. The user terminal is an application that receives the published slide information and displays it on user's devices. The current software is compatible with PC/Macintosh operating systems, iOS/Android tablets and smartphones, and network-accessible Windows CE-based braille note-takers.

### Advantages
- Real-time
- Automatic
- Presenter add-in is compatible with Powerpoint
- User terminal app is compatible with PC/Mac, iOS/Android, and braille note-takers

### Applications
- Individuals who wish to make presentation contents accessible to visually-impaired audience members
- Commercial, public and private entities that should comply with the Americans with Disabilities Act Standards for Information Accessibility.

**Stage of Development**
Working prototype with ongoing data collection

**IP Status**
Invention Disclosure submitted to the University of Pittsburgh

### Hyun Ka, PhD

Postdoctoral Researcher
School of Health and Rehabilitation Sciences
University of Pittsburgh

Dr. Ka is an expert in computer science and assistive technology for people with disabilities. He has extensive research experience in designing and developing advanced assistive technologies, such as alternative means of interacting with computers, Internet of Things (IoT), and machine learning applications for rehabilitation, intelligent control methods for assistive robot systems, and smart wheelchairs.

#### Education

PhD in Rehabilitation Science and Technology
University of Pittsburgh

MS in Instructional Technology
Yonsei University, South Korea

BS in Education and Computer Science
Yonsei University, South Korea

#### Publications

- Ka HW, Simpson RC (2017). Circling motion and screen edges as an alternative input method for on-screen target manipulation. Disability and Rehabilitation: Assistive Technology;12(3):227-35.
- Ka HW (2016). Real-time Synchronous Slideshow Presentation Access. Journal of Technology and Persons with Disabilities, 91.
- Ka HW, Ravishankar S (2016). Smart Signage: Technology Enhancing Indoor Location Awareness for People with Visual Impairments. Journal of Technology and Persons with Disabilities, 204.
- Ka H, Ding D, Cooper RA (2016). Three-Dimentional Computer Vision-Based Alternative Control Method for Assistive Robotic Manipulator. Symbiosis;1(1).
- Ka HW, Simpson R, Chung Y (2012). Intelligent single switch wheelchair navigation. Disability and Rehabilitation: Assistive Technology;7(6):501-6.

#### University of Pittsburgh
Innovation Institute

130 Thackeray Ave
Pittsburgh, PA 15260

**innovation.pitt.edu**

#### Contact

George Coulston, PhD MBA
Technology Licensing Manager
412-648-2236
gcoulston@innovation.pitt.edu