

ous, user-independent sign language recognition in classroom settings. The database of signing samples was collected from user studies and is characterized by hesitations inherent in continuous signing, varied user characteristics including clothing and skin tones, and illumination changes in the classroom.

Liu, A., Hile, H. (2006) **Indoor wayfinding: Developing a functional interface for individuals with cognitive impairments.** *ASSETS '06: Proceedings of the 8th international ACM SIGACCESS conference on computers and accessibility, October 22 - 25 2006, Portland, OR.* NARIC Accession Number: O17038. Project Number: H133A031739. Abstract: Discusses the development of a wayfinding system prototype designed for individuals with cognitive impairments. The prototype was implemented on a handheld computer to convey messages, directions, and prompts to the user. User studies evaluated various configurations of the user interface on indoor navigation tasks for accuracy of route completion, time to completion, and user preferences. All participants were able to follow the directions to their destinations. Results indicated that: (1) the way a user carries a wayfinding system has a significant effect on how the system is used; (2) timing of the prompts is crucial, and (3) an effective user interface should support multiple modalities (text, audio, graphics, and photographs).

Vanderheiden, G. (2007) **Redefining assistive technology, accessibility and disability based on recent technical advances.** *Journal of Technology in Human Services (formerly Computers in Human Services), 25(1/2), 12.* NARIC Accession Number: J52667. Project Number: H133E030012; H133E040013. Abstract: Article reviews recent advances in information technology, networking, and human interface research that impact the design of assistive technology products. The implications of these various technical advances for people with disabilities; the definitions of universal design, accessibility, and disability; and for human services are discussed.

Schultheis, M., Rebimbas, J. (2007) **Examining the usability of a virtual reality driving simulator.** *Assistive Technology, 19(1), 8.* NARIC Accession Number: J53456. Project Number: H133G000073. Abstract: Study examined aspects of usability in a virtual reality driver rehabilitation (VR-DR) system among 20 individuals with traumatic brain injury (TBI), 13 with stroke, and 21 healthy control subjects. The VR-DR is a computer-based system that uses a head-mounted display unit to visually present a virtual environment through which users can drive using a commercially available steering wheel and foot pedal. In addition to visual feedback, the VR-DR provides auditory and tactile feedback and allows the presentation of different driving challenges. Results indicated that the healthy control group reported significantly more favorable VR-DR ratings than both the TBI group and the stroke group. A standard multiple regression analysis revealed that age was the only significant participant factor that contributed to the differences in user feedback ratings. Finally, consistent across the three groups, as users' discomfort increased, the likelihood of simulation sickness increased.

Roberts, K. (2007) **Investing the impact of text-to-speech software on the reading comprehension of students with reading problems.** NARIC Accession Number: O17095. Project Number: H133F050046.

Abstract: Study investigated whether text-to-speech software (Kurzweil 3000) is an effective tool for improving unaided reading comprehension, reading rate, and reading skills in high school students with reading difficulties. Text-to-speech software provides access to written material that is otherwise inaccessible to individuals with poor reading skills. Results indicated that the subjects found the use of the software beneficial. This data is will be used to determine if the use of text-to-speech software leads to overall improved educational performance in secondary school and improved transition to valued post-school outcomes such as access to postsecondary education and employment.

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RehabWire
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Rehabilitation Information
Center

**Computer Technology
and the SBIRs**
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NIDRR Grantees on the Cutting Edge

SBIR Phase I projects spend six months determining the feasibility of and demand for an assistive technology product or intervention. NIDRR funds approximately 15 Phase I projects each year at \$72,000 each. Phase I products funded in 2007 included:

Development and Evaluation of Geo Talk: A GF Supported Portable Speech Output Device for Individuals with Intellectual Disabilities, *AbleLink Technologies, Inc.* (H133S070005) led by Steven E. Stock. Dawn Carlson, PhD, MPH, Project Officer.

Abstract: This project demonstrates the technical merit and feasibility of the GeoTalk approach for providing independent access to speech output functionality for individuals with intellectual disabilities with speech impairments.

ATLAS: An Accessible Testing and Assessment System for Individuals with Intellectual Disabilities to Facilitate Inclusion and Access to the General Curriculum, *AbleLink Technologies, Inc.* (H133S070010) led by Daniel K. Davies. Delores Watkins, Project Officer.

Abstract: This project develops and evaluates the Accessible Testing, Learning, and Assessment System (ATLAS), a testing and assessment system which can be used by teachers and evaluators to create independently accessible, self-paced tests and evaluations for students and adults with intellectual disabilities.

Visual Media Literacy System Enabling Individuals with Intellectual Disabilities to Independently Access Electronic Media for Learning and Recreation, *AbleLink Technologies, Inc.* (H133S070017) led by Daniel K. Davies. Dawn Carlson, PhD, MPH, Project Officer.

Abstract: This project develops and tests the Visual Media Literacy System, an accessible software system with a simplified, picture-based interface design used for accessing electronic media resources on a standard desktop and/or portable palmtop computer.

The majority of NIDRR funded research in computers and computer applications comes through the Small Business Innovative Research (SBIR) funding mechanism. The 2-phase program encourages exploration and development of new technologies and interventions by small business across the country. Visit www.ed.gov/programs/sbir/index.html for more information.

Please note: These abstracts have been modified. Full, unedited abstracts, as well as any available REHABDATA citations, are available at naric.com.

Thousands of additional resources on these topics are available from NARIC's resource pages at www.naric.com/public

The majority of NIDRR SBIRs fall in the Technology for Access and Function priority.

Wireless Wrist Device to Display Sound and Speech Information for the Deaf, *Advanced Medical Electronics Corporation (H133S070049)* led by Greg Seifert. Joyce Y. Caldwell, Project Officer.

Abstract: This project develops a wireless system to alert deaf people of critical sounds and events in their environment; utilizing a new consumer product called a Bluetooth wristwatch, a wireless, wrist-worn computer interface and display.

Multi-Modal Authoring Tool to Develop Age Appropriate Computer Learning for Children and Adolescents with Developmental Delays, *AnthroTronix, Inc.*

(H133S070050) led by Corinna Lathan. Dawn Carlson, PhD, MPH, Project Officer.

Abstract: This project demonstrates the technical and commercial feasibility of a multi-modal computer interface device and authoring toolkit for the development of age-appropriate computer learning for children and adolescents with developmental delays.

HearingCompanion: Handheld Portable Sound Identification and Critical Alerting Functionality for People Who Are Deaf or Have Hearing Loss,

CreateAbility Concepts, Inc. (H133S070067) led by Stephen M. Sutter. Bonnie Gracer, Project Officer.

Abstract: This project researches, develops, and demonstrates the technical merit and feasibility of the HearingCompanion system to: (1) utilize the unique frequency properties of sounds and current digital sound processing techniques to recognize specific sounds in the environment on a pocket-sized device; and (2) alert the user via vibration, images, and captions identifying recognized sounds.

Language Translation Device for Deaf Signers with Significant English Language Difficulties: Sign Language to/from English, *Ready! Set! Sign!, LLC*

(H133S070013) led by Martin Noretzky. Bonnie Gracer, Project Officer.

Abstract: This project creates a translation software program for hand-held computers or PDAs for deaf signers to create simple, unambiguous English sentences.

Handsight: Mobile Services for Low Vision, *The Blindsight Corporation*

(H133S070044) led by Mark Nitzberg. Edna Johnson, PhD, Project Officer.

Abstract: This project conducts a feasibility study to determine the user interface requirements - response time, accuracy, and function set - needed for the Handsight cell phone service to significantly improve independence.

Phase II SBIRs move from the feasibility stage to the design and development stage. Ultimately, the two-year project will result in a marketable product or intervention. The projects are funded at \$250,000 per year. Currently funded Phase II projects include:

Web-Enabled Creation and Distribution of Audio-Tactile Maps for Use in Orientation and Mobility Training, *Touch Graphics, Inc.* (H133S060105) led by Steven Landau. Phillip Beatty, PhD, Project Officer.

Abstract: Phase II of this project develops a system for providing one-off, talking, tactile neighborhood maps on demand for use by individuals who are blind, have low vision, or have other print disabilities.

When asked about the future of computer technology, Ray Kurzweil, inventor of the Kurzweil

Reader for the blind, said "By 2020 or 2030, I think computers will surpass basic human intelligence."

Business Week, Feb 28, 1998 retrieved 4/14/08 from www.businessweek.com/1998/08/b3566022.htm

Photo credit: Jayesh Nair, India



Where Can I Find More?

A quick keyword search is all you need to connect to a wealth of disability and rehabilitation research. NARIC's databases hold more than 75,000 resources. Visit www.naric.com/research to search for literature, current and past research projects, and organizations and agencies in the US and abroad.

Closing The Gap

Each year, Minneapolis-based Closing the Gap hosts a large conference on technology and disability, with a strong focus on computer technology. This year the conference falls on October 14th and 15. It features more than 200 presentations, preconference workshops, and a large exhibit hall. To register, exhibit, or present, visit www.closingthegap.com for more information.

WorkRight SkillBuilder: A Customizable State-of-the-Art Simulation Software System to Support Vocational Social Skills Training for Students and Adults with Intellectual Disabilities, *AbleLink Technologies, Inc.* (H133S060099) led by

Steven E. Stock. Dawn Carlson, PhD, MPH, Project Officer.

Abstract: WorkRight SkillBuilder, is a state of the art computer-based simulator application designed to provide customizable, self-directed social skills training for individuals with intellectual disabilities on community-based vocational social skills utilizing state-of-the-art computer simulation, animation, a multimedia framework, and universal design concepts.

Why Go It Alone? The Use of Public Resources to Enhance Computer Accessibility for Individuals with Intellectual Disabilities, *Life Technologies, LLC*

(H133S070096) led by Lynn Fox. Dawn Carlson, PhD, MPH, Project Officer.

Abstract: The Personal Access Computer Key (PACK) is a modified Universal Serial Bus (USB) designed to accommodate adaptive software and can be launched on publicly accessible, updated computers.

Current Literature - Selections from REHABDATA

Mahajan, H., Spaeth, D. (2006) **A wheelchair driving simulation for people with low visual attention span.** *29th Annual RESNA Conference Proceedings.*

NARIC Accession Number: O16696. Project Number: H133A020502.

Abstract: This paper discusses the development of a two-dimensional, computer-based simulation for training and evaluating the wheelchair driving performance in people with compromised visual field and attention spans. The virtual wheelchair driving software runs on the operator's computer with a large television screen display. The user sits in a stationary wheelchair and operates the simulation with an isometric joystick. The operator wears a hat with a magnet attached to it and rests his or her head on the headrest-shaped head position monitor, which has strategically mounted transistors that aid in detecting orientation of user's head by magnetic triangulation. Other than halting wheelchair if the direction of visual focus and head orientation are different, currently there is no other feedback provided to the user.

Brashear, H., Henderson, V. (2006) **American Sign Language recognition in game development for deaf children.** *ASSETS '06: Proceedings of the 8th international ACM SIGACCESS conference on computers and accessibility, October 22 - 25 2006, Portland, OR.*

NARIC Accession Number: O17037. Project Number: H133E010804.

Abstract: Article describes the design and evaluation of CopyCat, an educational computer game that uses gesture recognition technology to develop American Sign Language (ASL) skills in children who are deaf. The game focuses on the practice and correct repetition of ASL phrases and allows the child to communicate with the computer via ASL. Discussion includes a brief history of the game, an overview of recent user studies, and the results of recent research on the problem of continu-