Zipfel, E., Cooper, R. (2007) **New design and development of a manual wheelchair for India.** *Disability and Rehabilitation, 29(11-12), 949-962.* NARIC Accession Number: J52901. Project Number: H133E990001.
Abstract: Article describes the 4-year process to design and produce a manual wheelchair that meets the needs of users in India. The process is an ongoing collaboration between the Human Engineering Research Laboratories (HERL) and the Artificial Limbs Manufacturing Corporation of India (ALIMCO). The process consisted of prototypes, small production runs, testing according to American National Standards Institute (ANSI) and the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) standards, hardness and tensile testing, and informal user testing. The design is a manual folding cross-brace design with several points of adjustability. Some of the challenges encountered throughout the HERL-ALIMCO collaboration process are described along with solutions to remedy the problems for future projects.

Blackstone, S. (2007) **University & research.** *Augmentative Communication News, 19(3), 1-4.* NARIC Accession Number: J56444. Project Number: H133E080011.
Abstract: Article examines the potential impact of research and development activities conducted through the Rehabilitation Engineering Research Center on Communication Enhancement (AAC-RERC). Discussion focuses on the role of knowledge translation (KT), which encompasses a range of activities and processes designed to ensure the utilization of research-based knowledge. KT bridges the gap between research and practice in ways that improve service delivery, shape disability and rehabilitation policy, and enhance the lives of people with disabilities.

Shen, H., Coughlan, J. (2007) **Grouping using factor graphs: An approach for finding text with a camera phone.** *Lecture Notes in Computer Science, 4538, 394-403.* NARIC Accession Number: O17412. Project Number: H133G030080.
Abstract: Article describes a new framework for feature grouping based on factor graphs, which are graphical models that encode interactions among arbitrary numbers of random variables. The ability of factor graphs to express interactions higher than pairwise order is useful for modeling a variety of pattern recognition problems. In particular, this property makes factor graphs a natural framework for performing grouping and segmentation, which is applied to the problem of finding text in natural scenes. The authors demonstrate an implementation of a factor graph-based algorithm for finding text on a Nokia camera phone, which is intended for eventual use in a camera phone system that finds and reads text (such as street signs) in natural environments for blind users.

Coughlan, J., Manduchi, R. (2007) **Functional assessment of a camera phone-based wayfinding system operated by blind users.** *In Conference of IEEE Computer Society and the Biological and Artificial Intelligence Society (IEEE-BAIS), Research on Assistive Technologies Symposium (RAT '07), Dayton, Ohio, USA, April 2007.* NARIC Accession Number: O17414. Project Number: H133G030080.
Abstract: A new assistive technology system has been designed to aid people with visual impairments in wayfinding (the ability of a person to find his or her way to a given destination). The wayfinding system is based on a camera cell phone, which is held by the user to find and read aloud specially designed signs in the environment. These signs are barcodes marked with simple color patterns (targets) that can be quickly and reliably identified using image processing algorithms running on the camera phone. In order for this system to be truly usable, it is important to ensure that color targets in the environment can be quickly discovered by a user holding the camera phone. This article describes the development of simple models that tune a number of algorithmic and color target design parameters to optimize the color target detection and to assess the performance of the system in terms of average time to discovery in typical conditions. Experiments with blind individuals tasked with finding and reading aloud simple Braille signs are presented in order to validate the analytical models.

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Blackstone, S. (2007) ***Augmentative communication news. 19(3).*** NARIC Accession Number: R08995. Project Number: H133E080011.
Abstract: This issue examines the potential impact of research and development activities conducted through the Rehabilitation Engineering Research Center on Communication Enhancement (AAC-RERC). Discussion focuses on the role of knowledge translation (KT), which encompasses a range of activities and processes designed to ensure the utilization of research-based knowledge. Case examples illustrate 3 AAC-RERC projects that show how a KT approach can lead to successful technology and knowledge transfer activities.

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NIDRR Grantees on the Cutting Edge

Center on Knowledge Translation for Technology Transfer *University at Buffalo; The State University of New York* (H133A080050) led by Joseph Lane. Pimjai Sudsawad, ScD, Project Officer.
Abstract: The objective of this project is to study and apply the theory and practice of knowledge translation (KT) to the knowledge outputs of NIDRR technology grantees. Goals of this project are improved understanding of barriers to accomplishing KT for technology transfer (TT) and carriers to overcome them; advanced knowledge of the best models, methods, and measures for accomplishing KT for TT; and increased utilization of the validated best practices for KT for TT by the NIDRR grantees. Research Project 1 synthesizes current knowledge about KT theory and practice related to accomplishing technology transfer outcomes; establishes parallel models of practices for both knowledge translation and technology transfer; and creates an operational framework for the Knowledge To Action (KTA) model, by applying the technology transfer methods and measures promulgated by the Product Development Manager's Association (PDMA), to create counterparts in knowledge translation. Project 2 establishes parameters for defining new knowledge as an innovation, and establishes Grantee Innovation Profiles for participating RERC and SBIR grantees in wheeled mobility, sensory disability, and environmental access technology areas; and interviews representatives for the six categories of knowledge users (i.e., researchers, manufacturers, clinicians, policy makers, consumers, brokers), to establish Knowledge Value Profiles for each user category. Research Project 3 conducts a series of six intervention studies in the three technology areas. They communicate a series of randomly selected innovations to the six user categories, either through standard knowledge dissemination practices, or through knowledge translation practices applied through the operational KTA model. Development Project 1 conducts a series of at least six technology transfer demonstration projects, working in collaboration with corporate partners, while RERC and/or SBIR grantees interact as participant observers. Development Project 2 creates a knowledgebase consisting of a data base structure customized for access by each category of knowledge user based on their respective value systems, along with all DRRP training materials publicly available in accessible and usable forms. A Utilization Project encourages NIDRR grantees to

Technology transfer is "the movement of new technology from its creator or researcher to a user, esp. as products or publications; also, the movement of new technology from developed areas to less-developed areas."

Source: Dictionary.com

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Technology transfer is an integral component of NIDRR's Technology for Access and Function priority.

use the DRRP's materials, and implement the operational KTA model, through coordinated dissemination, training, and technical assistance projects. This project also promotes the diffusion and utilization of innovative research-based knowledge by targeting each of the six categories of knowledge users with a parallel coordinated program of the same multiple methods.
Find out more at: http://kt4tt.buffalo.edu

Rehabilitation Engineering Research Center on Spinal Cord Injury *University of Pittsburgh* (H133E070024) led by David M. Brienza, PhD. Kenneth D. Wood, PhD, Project Officer.
Abstract: This center conducts research, development, and evaluation of innovative technologies and approaches that will improve the treatment, rehabilitation, employment, and reintegration into society of persons with spinal cord injury (SCI). Research and development activities address tissue integrity management, upper extremity musculoskeletal injury prevention, and bladder function. Specific projects address: (1) the development of computational models of inflammation and healing for assessment of person-specific interventions and for general technology/intervention evaluations for pressure ulcer prevention and detection, (2) evaluation of the effects of support surface active cooling and low shear followed by development and evaluation of a novel seat cushion incorporating these features, (3) the development and evaluation of tools for manual wheelchair propulsion training, (4) the evaluation of novel manual wheelchair propulsion devices for preventing shoulder injury, (5) the evaluation of a weight shifting approach for preventing pressure ulcers, and (6) the development of preliminary computational models of inflammation and healing for evaluating bladder function and musculoskeletal injury status. The technology transfer program targets private and public sectors. The training and knowledge translation plan is equally broad based, targeting graduate and undergraduate students, practicing clinicians, researchers, and individuals with SCI and their caregivers.

Current Literature - Selections from REHABDATA

Higginbotham, D., Beukelman, D. (2009) **AAC technology transfer: An AAC-RERC report.** *Augmentative and Alternative Communication, 25(1), 68-76.* NARIC Accession Number: J56456. Project Number: H133E030018.
Abstract: Article focuses on the technology transfer process as it relates to augmentative and alternative communication (AAC). The concept of technology transfer is introduced, barriers to technology transfer are reviewed, and some technology transfer strategies are outlined and illustrated using activities of Rehabilitation Engineering and Research Center in Communication Enhancement (AAC-RERC). The AAC-RERC has worked with the manufacturing community for the last 10 years to help transfer technological innovations from universities to the AAC field.

Roth, E., Lovell, L. (2008) **Design of products and environments for people with stroke.** *Topics in Stroke Rehabilitation, 15(2), 73-176.* NARIC Accession Number: R08931. Project Number: H133B031127.
Abstract: This journal issue contains articles that reflect the topics presented at the State of the Science Conference on Strategic Development of Products and Environments for People with Strokes. Topics include: the Chicago perspective on design for the disabled, creating engaging experiences for rehabilitation, the role of people with disabilities in the design process, the design of a progressive building constructed by an independent living center, a new model for universities and companies to work together to meet the needs of 50+ consumers, developing more desirable products for stroke survivors, designing an accessible waterfront park, designing the experience of health care, and the design and development of a robotic overground gait and balance therapy device. In addition, several articles illustrate the products and process of design for stroke survivors conducted in an undergraduate engineering design class at Northwestern University. Individual articles are available for document delivery under accession numbers J54320 through J54335, J54997, and J55003.

Enders, A., Brandt, Z. (2007) **Using geographic information system technology to improve emergency management and disaster response for people with disabilities.** *Journal of Disability Policy Studies, 17(4), 223-229.* NARIC Accession Number: J52284. Project Number: H133B000500; H133B030501.
Abstract: Article explains how geographic information system (GIS) technology can be used to improve emergency management and disaster response for people with disabilities. GIS is a system for management, analysis, and display of geographic knowledge that can be used to associate resources and people spatially. The most essential elements of GIS are the data, tied to location, that support the visual images on a map. GIS allows disaster managers to quickly access and visually display critical information by location. A map showing the proximity of available resources demonstrates the importance of GIS to people with disabilities by identifying available resources in disaster response and recovery. The analytical abilities of GIS support all aspects of disaster management: planning, response and recovery, and records management.

Vanderheiden, G. (2007) **Redefining assistive technology, accessibility and disability based on recent technical advances.** *Journal of Technology in Human Services, 25(1/2), 147-158.* 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.

Reisinger, K., Casanova, H. (2007) **Comparison of a priori alignment techniques for transtibial prostheses in the developing world - pilot study.** *Disability and Rehabilitation, 29(11-12), 863-872.* NARIC Accession Number: J52898. Project Number: H133E030017; H133E980031.
Abstract: Study evaluated the feasibility of the anatomically-based alignment (ABA) and the vertical alignment axis (VAA) techniques for providing prosthetic services to remote areas of landmine-affected countries. Five prosthetists and 5 unilateral transtibial amputees participated in the study. Each prosthetist used each of 3 systems (ABA-supine, ABA-standing, and VAA) to capture alignment measures for one subject. Three monolimbs were fabricated for each subject and assessed during clinical static and dynamic gait conditions. All 3 systems captured acceptable alignments fairly well, although the 2 systems that incorporated weight-bearing into the alignment process (ABA-standing and VAA) had slightly better outcomes. The VAA approach was favored in terms of speed of alignment capture. Each system has its own advantages in terms of ease of use, required equipment, and ease of technology transfer.

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ABLEDATA's AT-Lit database includes 28 abstracts focusing on technology transfer. These and many more abstracts are available in the Library at **www.abledata.com**.