

TechSage News

Fall 2022



Rehabilitation Engineering Research Center on
Technologies to Support Aging-in-Place for
People with Long-Term Disabilities



TechSage Project Directors:
Tracy L Mitzner, Ph.D., Wendy A. Rogers, Ph.D., & Jon A. Sanford, M.Arch.

Project Coordinator: Elena Remillard, M.S.

Georgia Institute of Technology, University of Illinois Urbana-Champaign,
& Georgia State University



In this issue of TechSage News, we take a look back at the past year to highlight achievements and updates from the Center. Learn more about our featured projects and staff, and catch up on the latest events, publications, and study opportunities.

STATE OF THE SCIENCE CONFERENCE

The highlight of the 2021-2022 year was our [State of the Science Conference](#). This hybrid event was held May 4-5, 2022 with the opportunity to participate in-person at the Illini Center in Chicago, IL or online via Zoom. The over 100 attendees included TechSage team members, advisory board members, and community partners, as well as interdisciplinary researchers and students in the aging and disability field.

The conference highlighted research advances and priorities in technologies to support people aging with disability. Sessions focused on our four areas of research: Maintain Health and Wellness; Enhance Connectivity and Community Mobility; Support Safety and Independence in Everyday Home Activities; and Facilitate Caregiving. Each topical session featured 3 presentations and moderated discussion. We were honored to have a distinguished [panel of speakers](#) who represent leading experts in research, industry, and service provision at the intersection of aging, disability, and technology. These thought-provoking presentations and discussions will help guide future directions of TechSAGE research.

[Watch the Recordings](#)



Amy Lulich, Senior Policy Advisor with the Illinois Department on Aging, gives opening remarks on Day 2 of the conference.



Girish Krishnan, Associate Professor of Industrial & Enterprise Systems Engineering at Illinois, presents work on soft robotics to support remote healthcare delivery for older adults.

This conference was the first in-person TechSAGE event since 2019, before the COVID-19 pandemic began. Those able to make the trip to Chicago enjoyed the chance to reconnect with colleagues and make new face-to-face connections. The TechSAGE team also hosted an interactive showcase, including posters and demonstrations, where attendees could discover TechSAGE research, development, and training projects. You can view the videos and poster from the TechSAGE Showcase [here](#) (note: click link and scroll to bottom).



Susan Lee, Tracy Mitzner, and Jon Sanford reconnect at the conference.



Invited speakers Katie Perumbeti (Atlanta Regional Commission) and Amy Eisenstein (RRF Foundation for Aging) try out low-tech solutions to support people with disabilities in solving everyday problems.



Jake Sosnoff and Laura Rice share their latest research findings with Susan Lee during the TechSage Showcase.



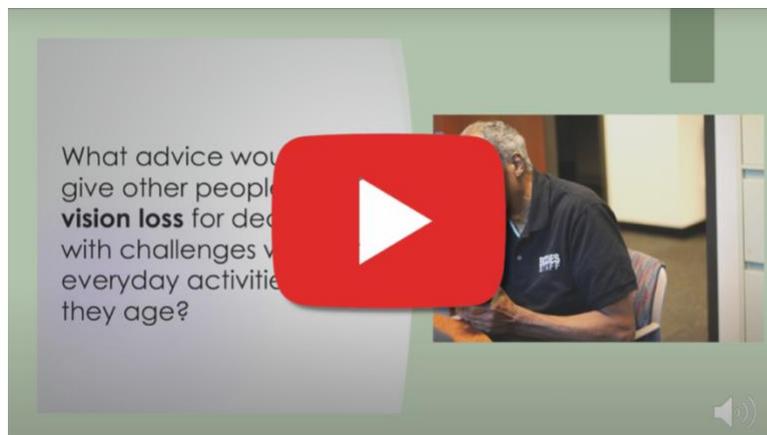
TechSage team members, board members, and conference attendees enjoy a riverside dinner in downtown Chicago.

PROJECT SPOTLIGHT

Needs Assessment & Technology Use

Technology holds great potential to support the health and independence of people with disabilities as they age. However, for technologies to be effective in supporting aging-in-place, researchers and designers must understand the needs of the people who will use them. Led by PI Wendy Rogers, Khan Professor of Applied Health Sciences and Director of the [Human Factors and Aging Laboratory](#) at Illinois, the [R1 User Needs project](#) provides the groundwork to drive new research and guide the design of technology for people aging with disability.

The flagship study of the User Needs project is Aging Concerns, Challenges, and Everyday Solution Strategies (ACCESS), which seeks to understand the lived experiences of people aging with long-term disabilities. The large-scale interview study explores the breadth and depth of task performance challenges across a wide range of everyday activities in the home and community. Participants not only share insights on their specific challenges, but also the various ways they manage those challenges, from technology to their own innovative methods. Student and staff interviewers continue to be moved by the resilience, positivity, and ingenuity that participants demonstrate. Click the [video](#) below to hear advice from ACCESS participants study on dealing with challenges related to aging with disability.



Hear advice from participants in the Aging Concerns, Challenges, and Everyday Solution Strategies (ACCESS) study on dealing with challenges related to aging with disability.

The first phase of ACCESS included 180 participants in 3 groups of older adults: vision loss, mobility impairment, deaf individuals who use American Sign Language. The team continues to present and publish findings from this rich dataset and has established an archival analysis program to enable other researchers from a variety of disciplines to conduct their own analyses. Data collection for ACCESS Phase 2 is underway, with the goal of an additional 180 participants in new target populations including: vision loss due to macular degeneration or glaucoma, multiple sclerosis (MS), and late-deafened.

In reflecting on the significance of this project, PI Wendy Rogers noted, “When we're designing technology, we should consider all of its users— all of its potential stakeholders... older adults and people with disabilities are often not considered in the design process. By focusing on their needs, we make sure that our design solutions will accommodate them.”



Woman in power wheelchair navigates turning around in narrow kitchen.



Woman with low vision uses magnifier to view buttons on the stove.

The User Needs project is a support hub for other TechSage projects, providing resources and tools to help other researchers conduct user-centered research studies. To support participant recruitment, the user needs team maintains the [TechSage Participant Registry](#) – a database of over 350 older adults with a wide range of sensory and mobility abilities who have agreed to be contacted about research studies. Investigators can submit requests to share their study flyer with individuals who potentially qualify. The registry was designed as a way to broaden the inclusion and engagement of people in our projects.

The team developed two self-report assessments that gather key background information about individuals aging with disabilities in a standardized, streamlined format. The [TechSage Background Questionnaire](#) is a short, focused assessment that captures basic characteristics (e.g., demographics, health characteristics, use of support aids) and the [TechSage Minimum Battery](#) provides a more in-depth evaluation about participants, including additional topics like functional abilities and limitations for hearing, vision, and mobility; quality of life; and technology experience. Both assessments have been implemented on REDCap, which makes it easy for TechSage researchers to integrate into their projects. The User Needs team also developed [TechSage Tools](#): a series of "how-to" guides for conducting various aspects of human factors research that focus on including adults aging with disabilities. Tools have included a variety of topics from conducting heuristic analyses to tracking research and development design iterations.

Story by Chandler Pearson & Elena Remillard

FEATURED ARTICLE

Transportation Challenges for Persons Aging with Mobility Disability



Many individuals aging with mobility disability lack access to adequate transportation, which can hinder their ability to fully participate in society. A new TechSage article in the Disability & Health Journal presents detailed insights on the challenges that persons aging with mobility disability experience while utilizing both public and private modes of transportation, such as buses, paratransit, and rideshare services like Uber. Data are presented along with recent U.S. federal policies and programs designed to enhance transportation access and mobility for older adults and people with disabilities. To identify policy gaps and opportunities to improve transportation services for this population, TechSage researchers explored how consumer-level challenges compare to agency-level barriers in delivering transportation services at the state and local levels. Click below to read the full article by Elena Remillard, Margaret Campbell, Lyndsie Koon, and Wendy Rogers. *This article was highlighted in [Research In Focus: A Weekly Digest of New Research from the NIDILRR Community](#).

[Read the Article](#)

STRETCH ROBOT PITCH COMPETITION

TechSage presents

STRETCH ROBOT PITCH COMPETITION

in collaboration with
Hello Robot and P&G



hello robot™



Seeking creative solutions to support people aging with disabilities

Open to all majors (undergrad & grad) at the
University of Illinois Urbana-Champaign



The inaugural [Stretch Robot Pitch Competition](#), sponsored by TechSAGE RERC and in collaboration with [Hello Robot](#) and [P&G](#), was hosted at the [University of Illinois Urbana-Champaign](#). The competition sought innovative hardware or software solutions to support individuals aging with disabilities at home using the Stretch™ robot. Developed by Hello Robot, Stretch is an open-source mobile manipulator with reaching, grasping, and sensing capabilities to support people with a wide range of tasks. Students submitted a brief proposal and pitch video that detailed their concept for Stretch and how it addressed a need for individuals aging with disabilities. Graduate and undergraduate Illinois students, representing a wide range of disciplines, submitted novel ideas for Stretch to support this population. An interdisciplinary panel of judges including representatives from TechSAGE, Hello Robot, and P&G evaluated the submissions.

[Learn More](#)

First place was awarded to Maya Grant and Ilalee Harrison James, who proposed an enhanced gripping mechanism for Stretch that enables a hands-free method of opening bottles and tops. Two honorable mentions were awarded. Learn more about the winning submission and honorable mentions [here](#). Read the full news story from the College of Applied Health Sciences [here](#). The 2022 [Stretch Robot Pitch Competition](#) is currently underway at Georgia Tech.



Ilalee Harrison James (left) and Maya Grant (right) pose with Stretch Robot handing them their 1st place award certificate.

Honorable Mentions



Megan Bayles poses with Stretch Robot handing her an honorable mention certificate. She proposed a concept for a universal tool that can be attached to a variety of different handles to make grasping objects with Stretch easier with a vacuum and suction gripper that confirms to a variety of objects.



Shuijing Liu poses with Stretch Robot handing her an honorable mention award certificate. Liu and teammates Aamir Hasan, Eric Liang, Kaiwen Hong, Justin Lin, and Sean Yao proposed a concept of utilizing Stretch for indoor wayfinding assistance for people with vision impairment.

2022 GRADUATES



Sam Dasari, B.S.
Biomedical Engineering

Su Jin (Susan) Lee, Ph.D.
Architecture

Georgia Institute of Technology

Congratulations, TechSage GRADUATES

Class of 2022



University of Illinois Urbana-Champaign



Libak Abou, Ph.D.
Kinesiology

Emma Lachs, B.S.
Community Health

Vikram Ramavarapu, B.S.
Mathematics & Computer
Science

Kyreon Williams, B.S.
Interdisciplinary Health
Science

We asked a few graduates to share: **What have you enjoyed most about your involvement in TechSage research?**

"For me, working on TechSage research was exciting because of the innovative aspect of the project and the positive impact that we could make on people's daily lives." —
Libak Abou, Ph.D.

"I appreciated the interdisciplinary nature of the team, which allowed us to tackle challenging yet important problems in creative ways." —
Susan Lee, Ph.D.

AWARDS AND RECOGNITIONS



Ritika Sadalge, fourth year Pre-Med student at Georgia Tech, participated in the UCLA Public Health Scholars Training Program this past summer. This competitive program offered her direct experience working with community-based organizations to support public health initiatives. She interned with a local Los Angeles nonprofit, Black Women for Wellness (BWWLA), that focuses on reproductive justice and advocacy for women in healthcare.



Mikaela Frechette received the Joanne M. Carraway and Charles M. Carraway Scholarship. She completed her Ph.D. in Kinesiology this past summer and is now working as a Design Researcher at the product development consulting firm, Tekna. While working with Dr. Laura Rice in the Disability Participation and Quality of Life Research Lab, she investigated seated postural control of individuals with spinal cord injury and fall detection technology for people using wheeled mobility devices.



Megan Bayles, PhD Candidate in Community Health at the University of Illinois Urbana-Champaign, was chosen as the recipient of the 2022-2023 Chittenden Fellowship. This prestigious fellowship supports graduate students who have a research agenda focused on the intersection of health, wellness, and engineering.



Bethanie Sharp was nominated as an Undergrad Student Employee of the Year at the University of Kansas. Out of 50+ nominees, she was a top 5 finalist. Beth supports recruitment and interviews for the TechSAge ACCESS study. This August, she began a graduate program in Speech Language Pathology.

STAFF SPOTLIGHTS



Husna Hussaini is a Sociology and Molecular and Cellular Biology student at the University of Illinois Urbana-Champaign and research assistant at the Human Factors and Aging Lab. Husna supports the TechSAGE voice-activated digital assistants research and development projects, developing instructional materials to support older adults in setting up and using these devices. Husna is currently writing an Honors Thesis that seeks to explore the knowledge that older adults have about digital home assistants and their privacy and security while using them. Husna enjoys playing the clarinet, which she has played for 10 years.



Kyle Murphy is a senior Mechanical Engineering student at Georgia Tech, where he works as a research assistant in the Aware Home Research Initiative. He supports the design and development of the TechSAGE Smart Bathroom, a state-of-the-art bathroom laboratory with adjustable features and array of sensors designed to support people aging with mobility disabilities. Kyle has been actively involved with repairing, improving, and validating the design of its various features, including the SmartBathing and SmartToilet transfer systems. Fun fact: Kyle enjoys working on cars and keeping fish tanks.

PRESENTATIONS AND EVENTS

Discover recent TechSAGE conference presentations.



[Rehabilitation Engineering Society of North America \(RESNA\) 2022](#)

- Aging with Multiple Sclerosis: Exploring Everyday Activity Challenges and Technology User Needs (Lyndsie Koon)
- Developing a Fall Detection System to Monitor and Manage Falls (Laura Rice)
- Tools for Connected Home Technologies: Adjusting Telepresence Technology for Support (Ben Thompson)
- SmartBathroom Data Visualization Tool to Inform OT Clinical Reasoning (Jon Sanford)



[2022 International Symposium on Human Factors and Ergonomics in Health Care](#)

- Understanding Health Self-Management Challenges for Older Adults With and Without Mobility and Sensory Disabilities (Qiong Nie)
- [The Usability of a Smartphone-Based Fall Risk Health Application for Adult Wheelchair Users](#) (Mikaela Frechette)



AMERICAN PUBLIC HEALTH ASSOCIATION

For science. For action. For health.

American Public Health Association (APHA) 2021

- Telewellness: Using Videoconferencing to Deliver Exercise Classes that Foster Social Connectedness for Older Adults with Mobility Disabilities (Elena Remillard)
- Exploring Exercise Challenges & Response Strategies among Adults Aging with Long-Term Mobility Disability (Lyndsie Koon)



Gerontological Society of America 2021

- Technology Solutions for Everyday Barriers Among Deaf Older Adults (Megan Bayles)
- Delivering a Tai Chi Intervention to Adults Aging with Mobility Disabilities Using Zoom (Tracy Mitzner)
- Exploring Use of Digital Home Assistants for Older Adults: A Demonstration Project (Travis Kadylak)
- SmartBathroom Data Visualization Tool to Inform OT Clinical Reasoning (Jon Sanford)

PARTICIPANT SPOTLIGHT

Saul Morse



Saul Morse is a proud University of Illinois alumni who has provided decades of service and support to the university. In addition to being a member of the board of directors for the university's foundation, Saul has been an ongoing supporter of disability studies and student services, as well as an active research participant. As a polio survivor with a long-term mobility disability, Saul is eager to participate in TechSAge research studies that provide him with the opportunity to share his lived experience of aging with disability to help drive technology innovation.

On participating in TechSAge research, Saul shared, "To individuals who wonder whether this would be a valuable thing for them to do, I would urge you to try. You rarely feel as good as you do when you do something that could help someone else."

Saul has spent his career practicing law, both in public service and private practice, for the last fifty years. He has had extensive experience advising policymakers at the state level on accessibility in healthcare, transportation, and building construction to support individuals with disabilities in Illinois. Saul currently lives in Springfield where he continues to practice law and recently celebrated his 40th wedding anniversary with his wife.

Story by Chandler Pearson & Elena Remillard

OTHER NEWS

Recently Funded Grants by TechSAge Staff

- Center for Research and Education on Aging and Technology Enhancement (CREATE) with Sara Czaja (TechSAge board member) as the PI at Weill Cornell Medicine; This consortium includes Wendy Rogers at the University of Illinois, Neil Charness and Walter Boot at Florida State University, Joseph Sharit at the University of Miami, and Tracy Mitzner at Georgia Tech. CREATE has been awarded a five-year, \$14.7 million grant from the National Institute on Aging (National Institutes of Health). [View press release from Illinois College of Applied Health Sciences.](#)
- Stretching Their Reach: Robotic Support for Domestic Activities for Older Individuals with Mobility Limitations; National Institute on Aging (National Institutes of Health) Phase I Small Business Innovation Research Grant award of \$256,064 (PIs: Aaron Edsinger, Hello Robot and Wendy Rogers, University of Illinois).
- Disability Awareness Training and Education Program Expansion; CO+RE: The Community + Research Partnership Program grant award of \$50,000. (PI: Laura Rice).
- Development and Implementation of a Campus Recreation Disability Inclusion Training (CREDIT) Program; Illinois Campus Research Board award for \$29,854 (PI: Laura Rice).

Media Features

- Physician's Weekly article, "[Association Between Frailty & History of Falls in People with MS](#)", highlights Jake Sosnoff's research on frailty, multiple sclerosis, and falls.
- Dr. Anjali J. Forber-Pratt, NIDILRR Director, [tweets](#) about "TechSAge Tool: Conducting Research with Adults Aging with Sensory and Mobility Disabilities."

SELECT PUBLICATIONS

- Hsieh, K.L., Frechette, M.L., Fanning, J., Chen, L., Griffin, A., Sosnoff J.J. (2022). The Developments and Iterations of a Mobile Technology-Based Fall Risk Health Application. *Frontiers in Digital Health*, 4. <https://doi.org/10.3389/fdgth.2022.828686>
- Rice, L.A., Fliflet, A., Frechette, M., Brokenshire, R., Abou, L., Presti, P., Mahajan, H., Sosnoff, J. Rogers, W. A. (2022) Insights on an Automated Fall Detection Device Designed for Older Adult Wheelchair and Scooter Users: A Qualitative Study. *Disability and Health Journal*, 15(1), Supplement. <https://doi.org/10.1016/j.dhjo.2021.101207>
- Ramadhani, W., & Rogers, W. A. (2022). Understanding home activities challenges of older adults aging with long-term mobility disabilities: Recommendations for home environment design. *Journal of Aging and Environment*. <https://doi.org/10.1080/26892618.2022.2092929>

- Mitzner, T.L., Remillard, E.T.; Mumma, K.T. (2022). Research-Driven Guidelines for Delivering Group Exercise Programs via Videoconferencing to Older Adults. *Int. J. Environ. Res. Public Health*, 19, 7562. <https://doi.org/10.3390/ijerph19137562>

All publications available upon [request](#).

PARTICIPANT REGISTRY

We maintain a registry of names of people who are interested in being contacted about research studies. Opportunities include: surveys, focus groups, interviews, and technology evaluations. Depending on the study, you may be able to participate on the phone, online, on campus, at your home, or in other locations. Compensation varies by study.

Interested in joining? We need to ask you a few questions about yourself to see which studies you might be eligible for and match your interests with our researchers. This information is for screening purposes only and will not be shared with anyone outside of our research team. Click below to complete the brief survey.

[Join the Participant Registry](#)



STUDY OPPORTUNITIES

Research Study on Digital Assistance for Older Adults with Mobility Disability

We are conducting a study to understand the attitudes, experiences, and preferences toward the use of digital assistance technologies within the home by older adults with mobility disability over the span of up to 12 weeks. The technologies will be provided for free and self-installation will be facilitated by the research team.

Participants must:

- Be over the age of 60
- Fluent in English
- Self-identify as having a mobility disability before the age of 50
 - Either use a mobility aid (such as cane, crutches, wheelchair, walker, or scooter) OR
 - report having serious difficulty walking or climbing stairs
- Have no experience using: Digital home assistants (e.g., Amazon Echo); smart light bulbs; or smart plugs

- Own an Apple smart phone (preferred) or iPad
- Have personal WiFi network access (i.e., wireless router access)

Up to \$120 compensation and ability to keep the technologies provided upon completion of the study

[Click here for study flyer.](#)

Find Wheels: A Detection System to Monitor and Manage Falls Among Wheelchair Users

We are seeking wheelchair and scooter users to evaluate a prototype fall detection device. Participation involves: wearing watch device for 12 weeks, filling out surveys, and being interviewed after wearing the device.

Participants must:

- Use a wheelchair (power or manual) or scooter for at least 75% of your mobility
- Have used a wheelchair or scooter for at least 1 year
- Have a self-reported fall history (at least 1 fall in the past 3 years)
- Have access to a smart phone (android)
- Be able to come to Illinois or GT campus to get set up with watch

\$60 compensation

[Click here for study flyer.](#)

Tele Tai Chi Study: Seeking older adults with mobility challenges for an online, seated tai chi class

We are conducting a clinical trial for 'Tele Tai Chi' – a virtual, seated, group tai chi class for older adults with long-term mobility disabilities. Participation involves completing: an 8-week program with two 1-hour classes per week on Zoom, questionnaires, and an interview.

Participants must:

- Be between the ages of 60-80
- Have mobility challenges for at least 10 years
- Have access to a computer or tablet with a webcam and internet access

Up to \$60 compensation

[Click here for study flyer.](#)

Aging Concerns, Challenges, and Everyday Solution Strategies (ACCESS) 2: Late-Deafened Older Adults

We are conducting a study that explores the everyday activities and challenges among late-deafened older adults. Participation involves: an interview completed via Zoom or phone (1-1.5 hours) and questionnaires (30-45 minutes).

Participants must:

- Be between the ages of 60-80
- Be able to communicate in spoken English via phone or Zoom (with captions)
- Have a diagnosis of hearing loss in both ears for at least 10 years that:
 - Occurred after development of speech and language (late-deafened)
 - Is severe OR profound
- Have serious difficulty hearing (even with the use of a hearing aid)
- Have hearing difficulties that affect communication and daily activities

Compensation: \$45 in Amazon e-codes

[Click here for study flyer.](#)

UPCOMING EVENTS

[2022 World Congress on Gerontechnology](#)

- Hybrid event: October 22 - 26 in Daegu, South Korea

[Gerontological Society of America \(GSA\) 2022 Annual Scientific Meeting](#)

- In-person event: November 2 - 6, 2022 in Indianapolis, IN

TECHSAGE MISSION

- to support and empower people with chronic conditions and long-term impairments to age-in-place
- through increasing knowledge about, availability of, and access to effective design and technologies
- that enable individuals to sustain independence; maintain health; engage safely in basic activities at home and in the community; and fully participate in society.

FOLLOW US



For more information on TechSAge, visit our website: www.TechSAgeRERC.org

Rehabilitation Engineering Research Center on Technologies to Support Aging-in-Place for People with Long-Term Disabilities (RERC TechSAge). TechSAge is funded by grant #90REGE0006-01-00 from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR), a Center in the Administration for Community Living (ACL), Department of Health and Human Services (HHS).