Human Engineering Research Laboratories
VA Pittsburgh Healthcare System
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HERL QUARTERLY

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Photograph by Olga Brand

HERL HIGHLIGHT

Jessica Steinberg

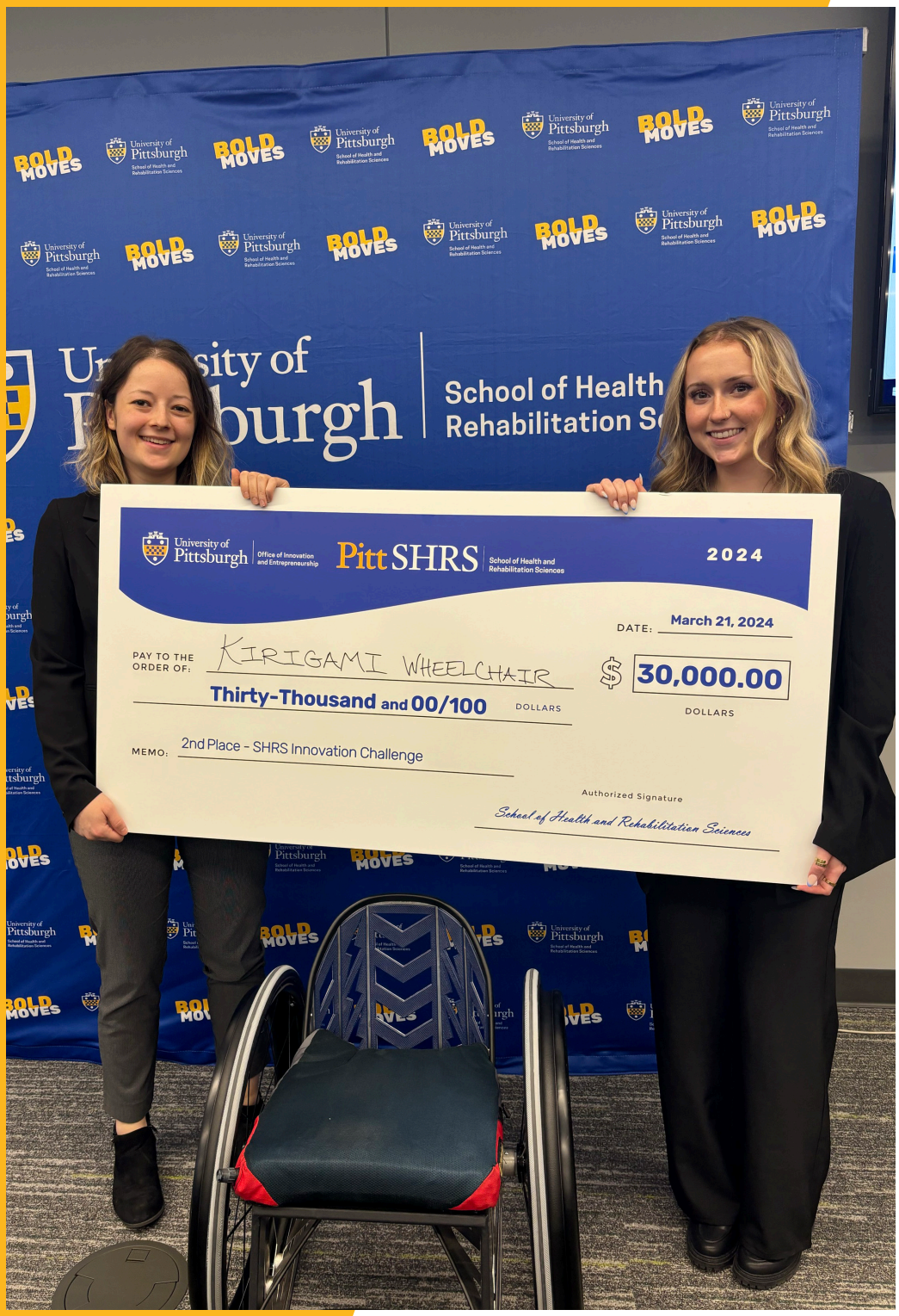
Research Engineer

Jessica's role at HERL is to design, fabricate and test various assistive technology and medical devices. She received a bachelor's degree in bioengineering from the University of Pittsburgh Swanson School of Engineering in 2023, and now she is pursuing a part-time master's degree in mechanical engineering. In her free time, she enjoys gardening and working on random hobby projects in her workshop.

In March of 2024, Jessica and undergrad co-op Danielle Scott placed second in the University of Pittsburgh School of Health and Rehabilitation Sciences' *Innovation Challlenge*.

"After many weeks of customer discovery interviews and many months of designing and fabricating the Kirigami Wheelchair, I'm excited to announce that we were awarded **$30,000** in the SHRS Innovation Challenge! This funding will allow us to further the development, testing, and ultimately the comercialization of the Kirigami Wheelchair."

- Jessica Steinberg
Research Engineer
Human Engineering Research Labs


BOLD MOVES
University of Pittsburgh
School of Health and Rehabilitation Sciences
University of Pittsburgh | Office of Innovation and Entrepreneurship
Pitt SHRS | School of Health and Rehabilitation Sciences
2024
DATE: March 21, 2024
PAY TO THE ORDER OF: KIRIGAMI WHEELCHAIR
$ 30,000.00
Thirty-Thousand and 00/100 DOLLARS
DOLLARS
MEMO: 2nd Place - SHRS Innovation Challenge
Authorized Signature
School of Health and Rehabilitation Sciences

Publications Manuscripts

An official website of the United States government

FULL TEXT LINKS

Full Text

Am J Phys Med Rehabil. 2024 Feb 6. doi: 10.1097/PHM.0000000000002457. Online ahead of print.

Evaluation of Electric and Air-Powered Shopping Scooters in Grocery Stores

Brandon J Daveler, Benjamin Gebrosky [1], Ian J Eckstein [1], Garrett G Grindle [1], Rosemarie Cooper, Rory A Cooper

Affiliations

PMID: 38363689 DOI: 10.1097/PHM.0000000000002457

Abstract

Objective: The purpose of this study was to further previous research and gather additional information regarding the usage of motorized shopping scooters as well as feedback for improvements to an air-powered scooter.

Methods: Online surveys were used to assess individuals' shopping characteristics and experience using the motorized scooters and to gather feedback from store employees regarding their experience. K-Means clustering analysis was used to determine user demographics who chose to use the air-powered scooter versus the electric powered scooter while shopping.

Results: A total of 127 individuals provided informed consent. 65 individuals from Site 1 and 62 individuals from Site 2. 120 participants met the inclusion criteria and completed the survey. K-Means clustering found that age, type of personal mobility device, shopping bill total, and frequency using a motorized shopping scooter to be significant factors in whether individuals chose to use an air-powered scooter or electric-powered scooter.

Conclusion: Motorized shopping scooters are in high demand and used by a wide variety of individuals, yet electric-powered scooters are commonly unavailable due to having dead batteries or all the devices being in use. Air-powered scooters may serve as a practical replacement for the current electric-powered scooters found in grocery and retail stores.

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NCI CPTAC Assay Portal

Evaluation of Electric and Air-Powered Shopping Scooters in Grocery Stores

Motorized shopping scooters are in high demand and used by a wi de variety of individuals, yet electric-powered scooters are commonly unavailable due to having dead batteries or all the devices being in use. Air-powered scooters may serve as a practical replacement for the current electric-powered scooters found in grocery and retail stores.

Brandon J. Daveler, PhD; Benjamin Gebrosky, BS; Ian J. Eckstein, MS; Garrett G. Grindle, Ph;, Rosemarie Cooper, MPT; Rory A. Cooper, PhD (2024). Evaluation of Electric and Air-Powered Shopping Scooters in Grocery Stores. *American Journal of Physical Medicine & Rehabilitation.*

Group Peer Mentoring to Improve Faculty Connections and Enhance Mentoring Networks

We found the peer mentoring program feasible to establish and an effective way to increase faculty feelings of connection and support. This is similar to other studies involving peer mentoring, but is novel in involving an entire departmental faculty rather than smaller specialized groups, and in a completely virtual meeting format as nearly all other described programs describe in person meetings.

Karen P. Barr, MD; Kerry Deluca, MD; Brad E. Dicianno, MD; Wendy M. Helkowski, MD; Betty Liu, MD (2024). Group Peer Mentoring to Improve Faculty Connections and Enhance Mentoring Networks. *The Clinical Teacher.*

Received: 28 July 2023 | Accepted: 19 January 2024

DOI: 10.1111/tct.13747

INNOVATION, IMPLEMENTATION, IMPROVEMENT

The CLINICAL TEACHER

Group peer mentoring to improve faculty connections and enhance mentoring networks

Karen P. Barr[1] | Kerry Deluca[1] | Brad E. Dicianno[1,2] | Wendy M. Helkowski[1] | Betty Liu[1]

[1]Department of Physical Medicine and Rehabilitation, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, USA

[2]Human Engineering Research Laboratories, VA Pittsburgh Healthcare System, Pittsburgh, Pennsylvania, USA

Correspondence

Karen P. Barr, Department of Physical Medicine and Rehabilitation, University of Pittsburgh School of Medicine/UPMC, Suite 910, 3471 Fifth Ave, Pittsburgh, PA 15213, USA.

Email: barrkp@upmc.edu

Funding information

No funding was received for this work.

Abstract

Background: Difficulty finding mentors and forging connections in academic departments can be challenging and became even more so when the COVID-19 pandemic reduced opportunities for informal networking. Even as restrictions on in-person meetings eased, many faculty preferred meetings to remain virtual. Because some of the most powerful predictors of faculty vitality are positive professional relationships and feelings of inclusion and belonging to an institution, attending to faculty needs in this area is important to mitigate undesired lingering consequences.

Approach: We created structured peer mentoring groups for our department's physicians and psychologists that meet virtually. Groups span career stages, academic appointments and clinical interests. The purpose was to establish a deeper culture of mentoring, increase feelings of connection to a supportive community within the department, facilitate career planning and enhance the development of skills necessary in academic medicine such as teaching skills, scholarly productivity and personal wellness.

Evaluation: A survey conducted after the first year of the programme was completed by 70% of eligible faculty (31/45). Ninety-six percent felt the programme had created an inclusive and appreciative culture, 86% met faculty members they had never met before and 79% sought mentoring advice from a colleague they would not usually have interacted with in that manner. All participants appreciated hearing their colleagues' perspectives on topics they do not typically discuss.

Implications: Departmentally based group peer mentoring that spans career stages and interests can facilitate faculty connections and enhance a supportive culture of mentorship.

1 | BACKGROUND

The need for increased faculty support and connection has come into sharp focus recently. Establishing an effective mentoring network has been described as both a key factor for academic success and career satisfaction as well as challenging to create.[1] The importance of support and connection became even more evident as faculty perceived the negative impacts of the COVID-19 pandemic on academic careers, including high levels of isolation and stress, decreased academic productivity and the increased challenge of navigating professional development. These challenges have contributed to increased levels of burnout and decreased levels of career satisfaction among

DISABILITY AND REHABILITATION: ASSISTIVE TECHNOLOGY
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REVIEW ARTICLE

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Rehabilitation clinicians' use of mainstream wireless technologies in practice: a scoping review

Brad E. Dicianno[a,b,c], Angad Salh[d], Lindsey Morris[b,c], Yifan Xiang[c] and Dan Ding[b,c]

[a]Department of Physical Medicine and Rehabilitation, School of Medicine, University of Pittsburgh, Pittsburgh, PA, USA; [b]Human Engineering Research Laboratories, VA Pittsburgh Healthcare System, Pittsburgh, PA, USA; [c]Department of Rehabilitation Science and Technology, School of Health and Rehabilitation Sciences, University of Pittsburgh, Pittsburgh, PA, USA; [d]College of Osteopathic Medicine, KS City University, Kansas City, MO, USA

ABSTRACT

Purpose: This scoping review was conducted to understand the barriers, facilitators, and education and training needs of rehabilitation clinicians in their use of mainstream wireless technologies (MWT) to support people with disabilities and older adults. It was also conducted to understand the functional skills of clients that were targeted with MWT use.

Materials and methods: This scoping review was reported using PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) and the Population (or Participants)/Concept/Context) framework. We searched PubMed; ProQuest to access APA PsycINFO; Web of Science Core Collection; and EBSCOhost to access Cumulated Index to Nursing and Allied Health Literature (CINAHL), Ovid MEDLINE ALL, and Education Resources Information Center (ERIC). Articles published between 2015–2022 were retrieved.

Results: A total of 90 articles were included. Most interventions were apps, smartphones, and tablets; were geared toward adults; and targeted motor, cognitive and speech skills. An infographic on barriers and facilitators was generated as a decision support tool for clinicians when implementing MWT. The topic, format, timing, and source of information clinicians need are also delineated.

Conclusion: MWT such as apps, smartphones and tablets are being used by rehabilitation clinicians to address motor, cognitive, and speech skills, most commonly in adults. Clinicians voice a need for more education and training. Barriers and facilitators exist at the clinician-, technology-, client-, institution-, and policy levels.

> IMPLICATIONS FOR REHABILITATION

- A total of 90 articles from 2015–2022 were included in this scoping review
- Most interventions were apps, smartphones, and tablets; were geared toward adults; and targeted motor, cognitive and speech skills.
- An infographic was generated as a decision support tool for clinicians when implementing mainstream wireless technologies in clinical practice.
- Clinicians' education and training needs with regard to mainstream wireless technologies are broad. Materials on a variety of topics, in different formats, from multiple sources are needed.
- This review also discusses implications of findings on policy, technology development, and future research.

ARTICLE HISTORY
Received 2 November 2023
Revised 23 January 2024
Accepted 6 February 2024

KEYWORDS
Aged; rehabilitation; telerehabilitation; wireless technology; mobile applications; smartphone; wearable electronic devices; disabled persons; frail elderly

Introduction

Approximately 1 in 3 people, or more than 2.5 billion people globally, need at least one assistive product, and this is expected to increase to 3.5 billion people by 2050 [1]. In 2021, almost 15 billion mobile devices including phones and tablets were being used globally, and this is expected to exceed 18.2 billion by 2025 [2]. The term "mainstream wireless technologies" (MWT) refers to wireless technologies designed for general use among consumers rather than being specifically designed for use among persons with disabilities. MWT are typically produced for mass market sale and include technologies such as smartphones, apps, tablets, smart home devices, smart speakers, wearables, and sensor devices [3]. Information and Communication technology (ICT) generally refers to electronic and information technology products such as computers, telecommunications equipment, and software [4]; some wireless ICT available to consumers are MWT. Although MWT are not covered as part of routine care in healthcare policies in many countries, in the U.S., Medicare now has established payment policies for reimbursement for remote monitoring technologies [5].

MWT can be used by people with disabilities and older adults to participate in activities in the home and community and interact with their environment and other devices. This is made possible by features such as text-to-speech, speech generation, voice control, word prediction, accessibility features, sound-amplification, and others [6]. Some therapeutic interventions using MWT are effective in improving outcomes. For example, use of some

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Rehabilitation Clinicians' Use of Mainstream Wireless Technologies in Practice: A Scoping Review

MWT such as apps, smartphones and tablets are being used by rehabilitation clinicians to address motor, cognitive, and speech skills, most commonly in adults. Clinicians voice a need for more education and training. Barriers and facilitators exist at the clinician-, technology-, client-, institution-, and policy levels.

Brad E. Dicianno; Angad Salh, Lindsey Morris; Yifan Xiang; Dan Ding (2024). Rehabilitation Clinicians' Use of Mainstream Wireless Technologies in Practice: A Scoping Review. *American Journal of Physical Medicine & Rehabilitation.*

Exploring Control Authority Preferences in Robotic Arm Assistance for Power Wheelchair Users

Our study explored control authority preferences among future ARM users. Through a mixed-methods investigation of user perspectives, we provide valuable insights for the design of future collaborative ARM systems that prioritize user autonomy and control.

Breelyn Kane Styler, Wei Deng , Reid Simmons, Henny Admoni , Rory Cooper and Dan Ding (2024). Exploring Control Authority Preferences in Robotic Arm Assistance for Power Wheelchair Users. *Actuators.*

actuators

MDPI

Article

Exploring Control Authority Preferences in Robotic Arm Assistance for Power Wheelchair Users

Breelyn Kane Styler [1,*], Wei Deng [1], Reid Simmons [2], Henny Admoni [2], Rory Cooper [1,2,3] and Dan Ding [1,3]

[1] Human Engineering Research Laboratories, VA Pittsburgh Healthcare System, Pittsburgh, PA 15206, USA; wed56@pitt.edu (W.D.); rcooper@pitt.edu (R.C.); dad5@pitt.edu (D.D.)
[2] The Robotics Institute, Carnegie Mellon University, 5000 Forbes Ave, Pittsburgh, PA 15213, USA; rsimmons@andrew.cmu.edu (R.S.); henny@cmu.edu (H.A.)
[3] Department of Rehabilitation Science and Technology, University of Pittsburgh, Pittsburgh, PA 15213, USA
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Abstract: This paper uses mixed methods to explore the preliminary design of control authority preferences for an Assistive Robotic Manipulator (ARM). To familiarize users with an intelligent robotic arm, we perform two kitchen task iterations: one with user-initiated software autonomy (predefined autonomous actions) and one with manual control. Then, we introduce a third scenario, enabling users to choose between manual control and system delegation throughout the task. Results showed that, while manually switching modes and controlling the arm via joystick had a higher mental workload, participants still preferred full joystick control. Thematic analysis indicates manual control offered greater freedom and sense of accomplishment. Participants reacted positively to the idea of an interactive assistive system. Users did not want to ask the system to only assist, by taking over for certain actions, but also asked for situational feedback (e.g., 'How close am I (the gripper)?', 'Is the lid centered over the jug?'). This speaks to a future assistive system that ensures the user feels like they drive the system for the entirety of the task and provides action collaboration in addition to more granular situational awareness feedback.

Keywords: assistive technology; user agency; mixed method; activities of daily living; usability

check for updates

Citation: Styler, B.K.; Deng, W.; Simmons, R.; Admoni, H.; Cooper, R.; Ding, D. Exploring Control Authority Preferences in Robotic Arm Assistance for Power Wheelchair Users. *Actuators* **2024**, *13*, 104. https://doi.org/10.3390/act13030104

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Published: 7 March 2024

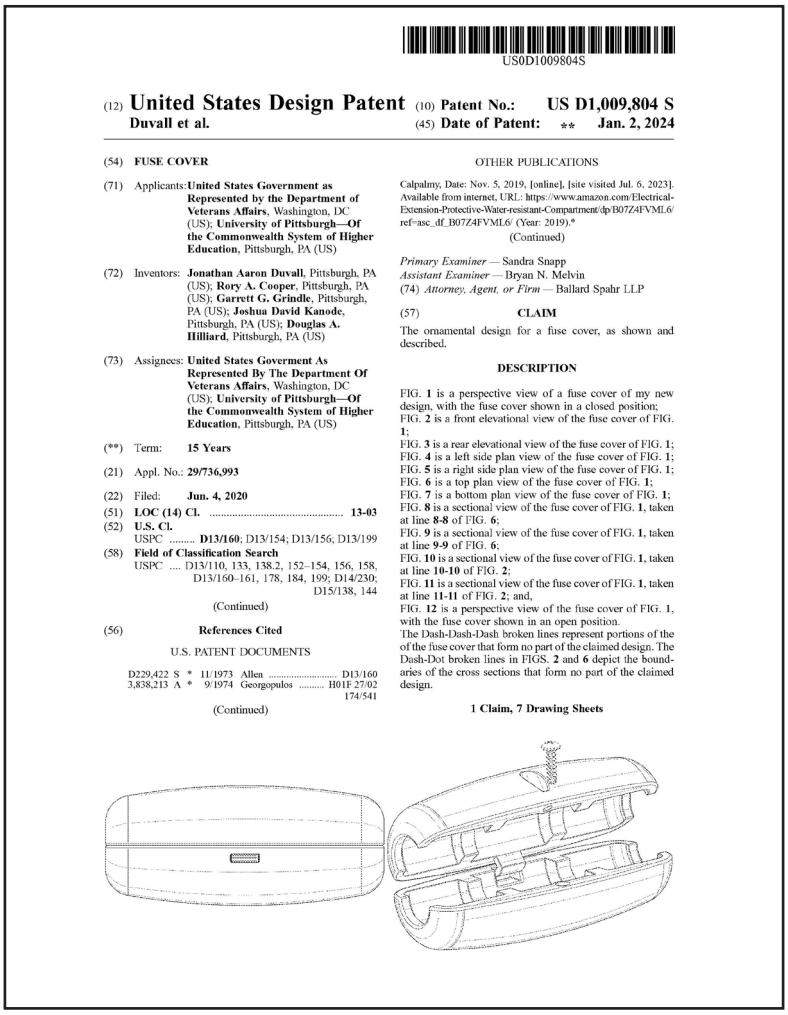
1. Introduction

As software intelligence is incorporated more into actuated assistive devices, it is important to understand usability preferences for when and how people may be soliciting assistance from those systems. Wheelchair-mounted Assistive Robotic Arms (ARMs) have the potential to enhance the independence of users with upper-limb impairments [1–3]. As ARM ownership becomes more common, it is important to understand the user's perspective on control and operation.

A trade-off emerges when incorporating software intelligence into assistive systems, forcing a choice between manual teleoperation and the ease offered by autonomous software assistance. Manual control offers advantages, as current robotic arms are controlled through the power wheelchair input, benefiting individuals skilled in operating power wheelchairs. Additionally, operating ARMs has been shown to increase user independence [3], which users value [4] despite inherent challenges such as longer operation times due to frequent mode switching. For example, an expert Kinova ARM user interviewed by Bhattacharjee et al. [5] noted that picking up a piece of fruit and bringing it to their mouth could take up to 45 min. Additionally, Herlant et al. [6] revealed that mode switching consumes 17.4% of task time, which increases cognitive load for users and highlights the mental demand [6,7]. However, these control challenges can be alleviated while preserving independence benefits through the integration of autonomous robotic arm functions [5].

Regarding software autonomy, robotic arm owners find this beneficial for repetitive or precise tasks [8], but where best to apply autonomous function and how it should adapt

Publications Patents



US0D1009804S

(12) **United States Design Patent** (10) **Patent No.: US D1,009,804 S**
Duvall et al. (45) **Date of Patent: ** Jan. 2, 2024**

(54) **FUSE COVER**

(71) Applicants: **United States Government as Represented by the Department of Veterans Affairs**, Washington, DC (US); **University of Pittsburgh—Of the Commonwealth System of Higher Education**, Pittsburgh, PA (US)

(72) Inventors: **Jonathan Aaron Duvall**, Pittsburgh, PA (US); **Rory A. Cooper**, Pittsburgh, PA (US); **Garrett G. Grindle**, Pittsburgh, PA (US); **Joshua David Kanode**, Pittsburgh, PA (US); **Douglas A. Hilliard**, Pittsburgh, PA (US)

(73) Assignees: **United States Goverment As Represented By The Department Of Veterans Affairs**, Washington, DC (US); **University of Pittsburgh—Of the Commonwealth System of Higher Education**, Pittsburgh, PA (US)

(**) Term: **15 Years**

(21) Appl. No.: **29/736,993**

(22) Filed: **Jun. 4, 2020**

(51) **LOC (14) Cl.** **13-03**

(52) **U.S. Cl.**
USPC **D13/160**; D13/154; D13/156; D13/199

(58) **Field of Classification Search**
USPC D13/110, 133, 138.2, 152–154, 156, 158, D13/160–161, 178, 184, 199; D14/230; D15/138, 144

(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D229,422 S * 11/1973 Allen D13/160
3,838,213 A * 9/1974 Georgopulos H01F 27/02 174/541

(Continued)

OTHER PUBLICATIONS

Calpalmy, Date: Nov. 5, 2019, [online], [site visited Jul. 6, 2023]. Available from internet, URL: https://www.amazon.com/Electrical-Extension-Protective-Water-resistant-Compartment/dp/B07Z4FVML6/ref=asc_df_B07Z4FVML6/ (Year: 2019).*

(Continued)

Primary Examiner — Sandra Snapp
Assistant Examiner — Bryan N. Melvin
(74) *Attorney, Agent, or Firm* — Ballard Spahr LLP

(57) **CLAIM**

The ornamental design for a fuse cover, as shown and described.

DESCRIPTION

FIG. **1** is a perspective view of a fuse cover of my new design, with the fuse cover shown in a closed position;
FIG. **2** is a front elevational view of the fuse cover of FIG. **1**;
FIG. **3** is a rear elevational view of the fuse cover of FIG. **1**;
FIG. **4** is a left side plan view of the fuse cover of FIG. **1**;
FIG. **5** is a right side plan view of the fuse cover of FIG. **1**;
FIG. **6** is a top plan view of the fuse cover of FIG. **1**;
FIG. **7** is a bottom plan view of the fuse cover of FIG. **1**;
FIG. **8** is a sectional view of the fuse cover of FIG. **1**, taken at line **8-8** of FIG. **6**;
FIG. **9** is a sectional view of the fuse cover of FIG. **1**, taken at line **9-9** of FIG. **6**;
FIG. **10** is a sectional view of the fuse cover of FIG. **1**, taken at line **10-10** of FIG. **2**;
FIG. **11** is a sectional view of the fuse cover of FIG. **1**, taken at line **11-11** of FIG. **2**; and,
FIG. **12** is a perspective view of the fuse cover of FIG. **1**, with the fuse cover shown in an open position.
The Dash-Dash-Dash broken lines represent portions of the of the fuse cover that form no part of the claimed design. The Dash-Dot broken lines in FIGS. **2** and **6** depict the boundaries of the cross sections that form no part of the claimed design.

1 Claim, 7 Drawing Sheets

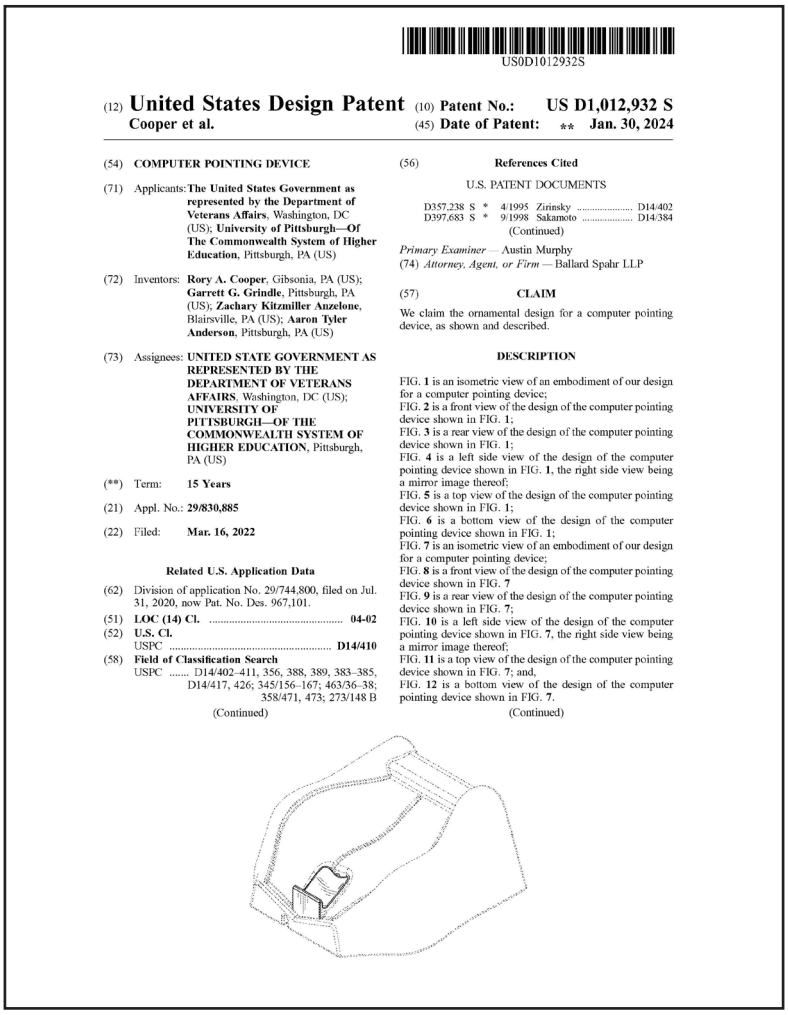
Fuse Cover

US D1,009,804 S

1/2/2024

The thermal fuse cover is a cover that clamps the thermal fuse on an oxygen line to the hose to prevent accidental removal and avert blowback in case of a fire. Breathable oxygen systems have a thermal fuse placed in the lines under the cannula to prevent a potential fire in the system from blowing flames into the patient's nose and/or mouth and causing severe internal burns. However, VA patients who use oxygen for respiration assistance frequently and mistakenly disconnect the lines at the thermal fuse when switching oxygen systems (portable to home-based, and vice versa) and leave the fuse out of the lines. This device is a clamp, which makes removing the fuse more difficult by clamping it to the lines and requiring tools to disconnect it.

Jonathan Aaron Duvall; Rory A. Cooper; Garrett G. Grindle; Joshua David Kanode; Douglas A. Hilliard.



US0D1012932S

(12) **United States Design Patent** (10) **Patent No.: US D1,012,932 S**
Cooper et al. (45) **Date of Patent: ** Jan. 30, 2024**

(54) **COMPUTER POINTING DEVICE**

(71) Applicants: **The United States Government as represented by the Department of Veterans Affairs**, Washington, DC (US); **University of Pittsburgh—Of The Commonwealth System of Higher Education**, Pittsburgh, PA (US)

(72) Inventors: **Rory A. Cooper**, Gibsonia, PA (US); **Garrett G. Grindle**, Pittsburgh, PA (US); **Zachary Kitzmiller Anzelone**, Blairsville, PA (US); **Aaron Tyler Anderson**, Pittsburgh, PA (US)

(73) Assignees: **UNITED STATE GOVERNMENT AS REPRESENTED BY THE DEPARTMENT OF VETERANS AFFAIRS**, Washington, DC (US); **UNIVERSITY OF PITTSBURGH—OF THE COMMONWEALTH SYSTEM OF HIGHER EDUCATION**, Pittsburgh, PA (US)

(**) Term: **15 Years**

(21) Appl. No.: **29/830,885**

(22) Filed: **Mar. 16, 2022**

Related U.S. Application Data

(62) Division of application No. 29/744,800, filed on Jul. 31, 2020, now Pat. No. Des. 967,101.

(51) **LOC (14) Cl.** **04-02**

(52) **U.S. Cl.**
USPC **D14/410**

(58) **Field of Classification Search**
USPC ..... D14/402–411, 356, 388, 389, 383–385, D14/417, 426; 345/156–167; 463/36–38; 358/471, 473; 273/148 B
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D357,238 S * 4/1995 Zirinsky D14/402
D397,683 S * 9/1998 Sakamoto D14/384
(Continued)

Primary Examiner — Austin Murphy
(74) *Attorney, Agent, or Firm* — Ballard Spahr LLP

(57) **CLAIM**

We claim the ornamental design for a computer pointing device, as shown and described.

DESCRIPTION

FIG. **1** is an isometric view of an embodiment of our design for a computer pointing device;
FIG. **2** is a front view of the design of the computer pointing device shown in FIG. **1**;
FIG. **3** is a rear view of the design of the computer pointing device shown in FIG. **1**;
FIG. **4** is a left side view of the design of the computer pointing device shown in FIG. **1**, the right side view being a mirror image thereof;
FIG. **5** is a top view of the design of the computer pointing device shown in FIG. **1**;
FIG. **6** is a bottom view of the design of the computer pointing device shown in FIG. **1**;
FIG. **7** is an isometric view of an embodiment of our design for a computer pointing device;
FIG. **8** is a front view of the design of the computer pointing device shown in FIG. **7**
FIG. **9** is a rear view of the design of the computer pointing device shown in FIG. **7**;
FIG. **10** is a left side view of the design of the computer pointing device shown in FIG. **7**, the right side view being a mirror image thereof;
FIG. **11** is a top view of the design of the computer pointing device shown in FIG. **7**; and,
FIG. **12** is a bottom view of the design of the computer pointing device shown in FIG. **7**.
(Continued)

Computer Pointing Device

US D1,012,932 S

1/30/2024

This patent is a pointing device for computer mice to be used by people with prosthetic hands. HERL focuses on innovative technologies that improve human mobility.

“The ability to use a computer is critical in today’s world, and using a mouse is ubiquitous unless you use a prosthetic arm. This technology opens an efficient, and cost-effective means for individuals who use prosthetic arms to access a computer, which could be revolutionary.” -Dr. Rory Cooper

Rory A. Cooper; Garrett G. Grindle; Zachary Kitzmiller Anzelone; Aaron Tyler Anderson.

Presentations Accepted

In Clinic Evaluation of the Transkinect for Automatic Assessment of Independent Wheelchair Transfer Technique

Alicia M. Koontz, Ph.D

EUROPEAN SEATING SYMPOSIUM

The TransKinect, a software application that uses a Microsoft Azure markerless depth sensing camera and machine learning models, was found to have acceptable usability and to support therapists in evaluating and educating their patients to determine proper from improper independent transfer technique.

Robotic Wheelchairs - Define, Develop and Evaluate

Sivashankar Sivakanthan, PhD

EUROPEAN SEATING SYMPOSIUM

The current landscape of electric-powered wheelchairs, especially for people with disabilities, presents significant risks due to inadequate stability in navigating challenging environments like damaged sidewalks and absent curb cuts. Addressing these challenges requires a pivot towards advanced technological solutions, primarily focusing on robotic wheelchairs. This workshop aims to bridge the gap in current research, which lacks a guided framework, and to propose innovative solutions that enhance the lives of individuals with disabilities.

Forging Effective Collaborations Between Clinicians and Researchers to Aid in the Transition of New Technology

Alicia M. Koontz, Ph.D

PVA SUMMIT

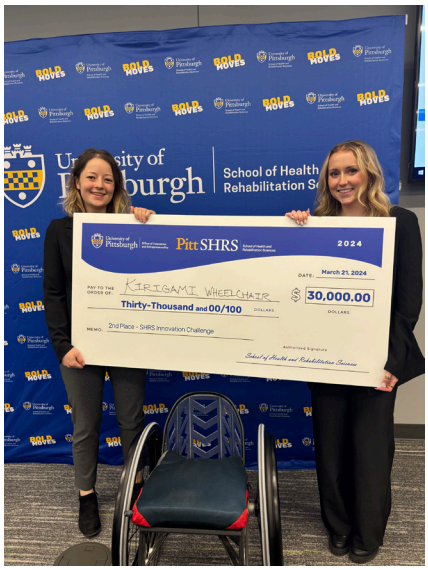
When developing new technologies to assist clinicians in their workflow and/or to support improved patient outcomes, it is critical that they are engaged in every step of the research and development process. Involving clinicians as partners in the research will maximize the potential for effective device translation and acceptance.

Rumination of the quarter

"Every day is a **BIG** day at HERL, and I'm excited to be a part of it."

-Iyan Nekib
Student Researcher




Pitt SHRS
2024
March 21, 2024
KIRIGAMI WHEELCHAIR
$ 30,000.00
Thirty-Thousand and 00/100
2nd Place - SHRS Innovation Challenge









Accolades & Highlights

Celebrating our best moments and achievements from the past three months.

Director **Dr. Rory Cooper** received a *Distinguished Alumni Award* from UC Santa Barabara, was elected to the *National Academy of Engineers*, was recognized by the University of Pittsburgh Athletics Program along with **Rosi Cooper**, was awarded a U.S. Patent for a *Computer Pointing Device* along with **Dr. Garrett G. Grindle**, **Zack Anzelone**, **Aaron Anderson**, and was named one of STAT's *Top 50 Influencers in the Fields of Health and Life Sciences*.

Dr. Adam Sterczala was awarded CCDF funds to build upon the analyses of his CDA, *Irisin/FNDC5 in individuals with spinal cord injury and its association with bone health*.

Dr. Ahlad Neti successfully defended his PhD dissertation on *An In-Depth Analysis on the Implementation of In-wheel Suspension in Manual Wheelchair Users.*

Dr. Jonathan Duvall, Dr. Rory Cooper, Dr. Garret G. Grindle, Joshua Kanode, and **Douglas Hilliard** were awarded a U.S. Patent for a *Fuse Cover*.

Research Engineer **Jessica Steinberg** and **Danielle Scott** received the second place award of $30,000 in the Pitt SHRS Innovation Challenge for their work on the *Kirigami Chair*.

On this year's **Pitt Day of Giving**, we raised more than $4,000 to support the vital research and engineering that we do.

The Human Engineering Research Laboratories' first quarter of 2024 included notable visits from: Pennsylvania State Representative **Rob Mercuri**, **Dr. Urs Schneider** for his lecture on *Bio-Intelligence, and How Human-Machine Interfaces Can Improve,* the **National Defense University's Dwight D. Eisenhower School for National Security and Resource Strategy**, **412 AbilityTech** for their third annual *412 AbilityTech Ecosystem Event*, Marine and author **Anthony Swofford**, students from the **Central Catholic Engineering Institute**, and **VA Leadership**.

Our faculty and staff gave a multiple of lectures around the globe!
HERL's Medical Director **Brad Dicianno, MD** discussed *Assistive Technology for Pressure Injury Prevention* at UPMC's Department of Plastic Surgery. He also presented work on *Pneumatic Technology for Powered Mobility Devices* at the Association of Academic Physiatrists' February meeting in Orlando, along with **Jeffrey Petigrow**.
Dr. Cooper spoke at the UK Parliament's House of Lords in February, and at the Emerging Researchers Network conference sponsored by the National Science Foundation (NSF) and the American Association for the Advancement of Science (AAAS) in March.

PHOTO GALLERY (LEFT TO RIGHT, TOP TO BOTTOM):
VA Leadership receives a MEBot demonstration by Dr. Jorge Candiotti (right) with Iyan Nekib on the chair (3/21).[1] Left to right: Iyan, Keshav Mukherjee, and Shantanu Satpute check work on the MEBot (3/6).[2] HERL's Jessica Steinberg and Danielle Scott place 2nd in SHRS Innovation Challenge (3/21).[3] The HERL team at our seasonal potluck (2/23).[4] A lunch held during Anthony Swofford's visit(2/20).[5] Iyan demoing the PTTS (2/20).[6] Jorge Candiotti presents to NDU (2/1).[7] Dr. Cooper presents to NDU (2/1).[8] Dr. Cooper and Dr. Keagle (2/1).[9] Josh Marino and Dr. Keagle (2/1).[10] HERL group photo with NDU students (2/1).[11] Rosi Cooper giving a tour to Carlow Univeristy OT students (2/14).[12] Dr. Cooper and Rosi Cooper pose with HERL team after receiving a live recognition by Pitt Athletics (1/12).[13] Dr. Urs Scneider and HERL after his lecture (1/30).[14]

In the News

Let's Talk Social Innovation

Self Respect, Paralympics, and A Better Future for the Disabled

January

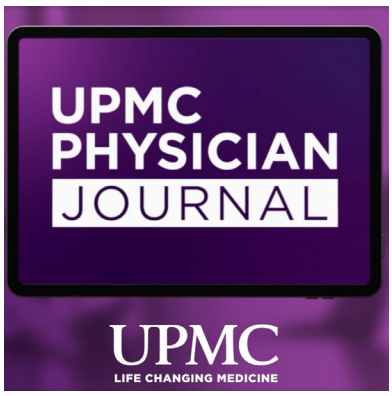
Dr. Cooper sits down with Ian Kehinde to talk about his upbringing, his time serving in the US military, his work at the Human Engineering Research Laboratories, and what everyday life is like for a disabled person.

AUSA's Army Matters Podcast

How a Bus Crash Improved the Lives of Countless Veterans

January

Host SMA (Ret.) Dan Dailey and guest co-host LaSherryn Duncan sit down with Dr. Cooper to discuss the impact of his Army experience, the numerous inventions he and his teams have overseen, his receipt of the National Medal of Technology and Innovation award – and what it's like to be one of only a handful of inventors to have ever been immortalized with a collectible trading card AND appear on a Cheerios box…

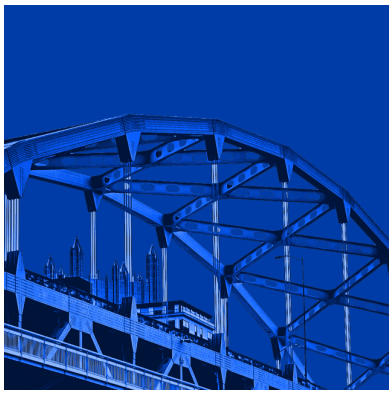


UPMC Physician Resources

Advances in Wheelchair Designs

January

Go inside the Human Research Engineering Laboratories (HERL) at the University of Pittsburgh as renowned engineer, author, and athlete Dr. Rory Cooper explains cutting-edge advances in wheelchair design.



Pittwire

Rory Cooper was elected to the National Academy of Engineering

February

Rory Cooper, a distinguished professor in Pitt's School of Health and Rehabilitation Sciences and founding director of the Human Engineering Research Laboratories, was among 114 new U.S. members elected to the National Academy of Engineering Class of 2024.

Paraplegia News

Rising Inclusion

February

Jr. Editor in Chief of PN writes about *Bridging the Gap*, the documentary film chronicling Dr. Cooper's life with his wife, Rosemary, as well as his impressive journey from an Army sergeant paralyzed in an accident in Germany, to becoming the founder and director of HERL.

Federal News Network

VA Researcher Devoted His Career to Technology for Assisting the Disabled

February

The Federal Drive with Tom Temin spoke with Rory Cooper, VA senior research career scientist, Paralympian, and the man who directs the Human engineering Research Laboratories, a joint VA and University of Pittsburgh effort.

STAT News

STATUS List 2024

February

Rory A. Cooper, PhD, PLY (University of Pittsburgh) has dedicated his career to advancing wheelchair technology and improving the mobility of people with disabilities. Meet one of the selections to the 2024 #STATUSList.

Recruiting

Scan here to sign up to our **Assistive Technology Registry.**

Scan here to learn more about the **Accessible Airline Transportation for Mobility Device Users: Survey.**

Scan here to learn more about the **Socially Connected Exercise System for Wheelchair Users**.

participants

Sign up to our Registry!

A research registry is a collection of individuals interested in learning about research studies that may be of interest to them. We are inviting you to join in the Human Engineering Research Laboratories (HERL) Assistive Technology Registry because you might be interested in participating in our current or future research studies.

Accessible Airline Transportation for Mobility Device Users: Survey

Principal Investigator: Rory Cooper, PhD

Purpose: To estimate pent-up demand among mobility device (MD) users to travel on commercial airlines and identify MD users' needs and pain points.

Study Requirements: Complete a survey about your demographics and airline travel experiences. The survey is expected to take no more than 20 minutes to complete.

Socially Connected Exercise System for Wheelchair Users

Principal Investigator: Alicia Koontz, PhD

Purpose: To identify the design needs and wants for an at-home, social-connected fitness machine for use by persons with disabilities.

Study Requirements: Join a group of others with disabilities to answer questions about their experiences using commercial fitness machines, fitness tracking apps and social-connected fitness apps with a group of other individuals with disabilities.

Scan here to learn more about **Bone Health in Individuals with Spinal Cord Injury**.

Scan here to learn more about the **Powered Personal Transfer System**.

Scan here to learn more about **Knee Stress-Relief Powered Exoskeleton**.

Bone Health in Individuals with Spinal Cord Injury

Principal Investigator: Adam Sterczala, PhD

Purpose: To learn about the connection between irisin (muscle- secreted bone mediating protein) and bone health in individuals with spinal cord injury (SCI). This study will also explore whether exercise can increase irisin concentrations in circulation.

Study Requirements: For more information or to check eligibility, call 412-822-3685 and mention the Irisin SCI Study.

Development and Evaluation of Powered Personal Transfer System (PPTS) for Wheelchair Users (Phase II)

Principal Investigator: Rory Cooper, PhD

Purpose: To collect feedback from caregivers and power wheelchair users on the PPTS transfer process and the new custom seating system.

Study Requirements: Caregivers will experience being transferred using the PPTS before testing how to transfer with the new system. Power wheelchair users will be transferred using the PPTS before navigating through a mobility course in a test wheelchair. than 20 minutes to complete.

Design Improvements and Evaluation of a Knee Stress-Relief Powered Exoskeleton for Veterans with Knee Osteoarthritis

Principal Investigator: Dan Ding, PhD

Purpose: To compare the study's performance to a passive knee brace in people with osteoarthritis (OA).

Study Requirements: Participants will answer questions and perform tasks during two visits.

Upcoming Events

Here are some important save-the-dates for events HERL will be hosting or participating in.

April 1-7: National Disabled Veterans Winter Sports Games
April 19-21: Buckeye Games
May 14: Distinguished Lecture @ HERL
May 21: Bumps in the Road, University of Pittsburgh showing
May 28: Mini-Symposium @ HERL
July 23: HERL's 30th Anniversary
July 24: Open House

RSVP!

Our Affiliations

Paralyzed Veterans of America

National Institute on Disability, Independent Living, and Rehabilitation Research

THANK YOU FOR READING!

Stay tuned for our next newsletter in July.

HERL QUARTERLY

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ALL OUR RELEVANT LINKS,
INCLUDING OUR WEBSITE AND
SOCIAL MEDIA ACCOUNTS!

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