

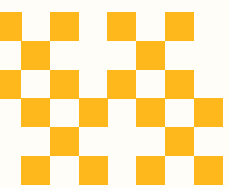
HERL

Quarterly

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JANUARY - MARCH 2025

BIG LEAPS IN Q1





BRAND NEW YEAR

D R I V E R S

KEYSTONE WHEELCHAIR GAMES

2025 marks the start of a new era for para-athletes in the USA. 14 registered athletes, 5 events, 40 spectators - this year's Keystone Games hosted at the Human Engineering Research Laboratories kickstarted a series of annual adaptive sports championships to be held every winter, right here in Pittsburgh. Congratulations to all the athletes that came out to compete this year! Thanks to the immense acclaim and success of this inaugural competition, we are already working toward doubling the size of our tournament for next year.

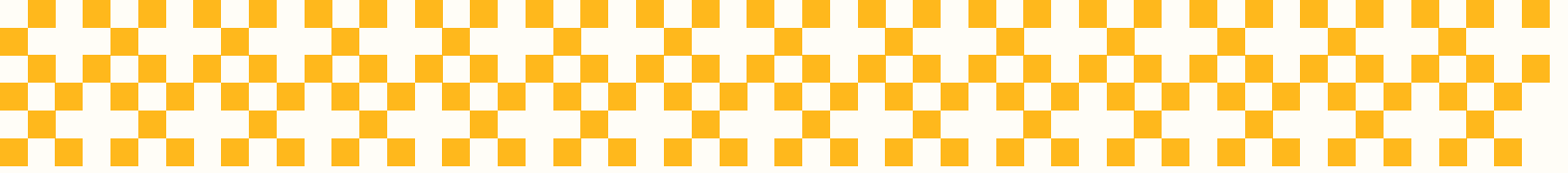
Stay tuned for updates on the 2026 Keystone Wheelchair Games registration window dates. Thank you to Easterseals of Western & Central Pennsylvania for supporting and co-hosting this event with us!



NIKITHA DEEPAK'S RETROSPECTIVE

"Looking back on my time at HERL since 2017, I just feel so grateful to be part of such an amazing team. As Asst. Director for Clinical and Regulatory Affairs, I've had the chance to work on some incredible projects like StrongArm, MWVC, MEBot, PPTS, and PneuMobility - all designed to enhance mobility and independence for people with disabilities. What truly makes HERL special is the collaboration, creativity, and shared passion for making a real difference.

Lately, I'm especially excited about our work in accessible transportation and all the futuristic projects we have in the works. It's inspiring to be part of a team that's constantly pushing boundaries and reimagining what's possible. I've learned so much from my colleagues, and I can't wait to see where we go next!"



ACCOLADES & HIGHLIGHTS

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

Director **DR. RORY COOPER** attended the 2025 Invictus Games, where HERL staff member **JACKSON WILLIAMS** won gold in the Men's Biathlon and silver in the 1-minute Indoor Row. Dr. Cooper participated as a panelist in the *ARPA-H: High-Potential, High-Impact Research* discussion, presented the HERL film *Bumps in Road* in Germany, paid a visit to students at Hopkinton Public Schools, attended the 28th Infantry Division's 146th Anniversary Dinner, spoke at the National Inventors Hall of Fame, and was awarded a recognition by members of the Pennsylvania Congress in the Harrisburg Capitol — alongside other Keystone PVA Veterans — for his medal placement at last year's National Disabled Veterans Wheelchair Games. Dr. Cooper was the keynote speaker at the Patent Trial and Appeal Board (PTAB) Bar Association's panel on leadership in inventing.

Former PhD and Summer Research Experience (REX) students from HERL won awards this year for their research conducted in our programs. **JESSICA STANLEY** (University of Maryland), mentored by **DR. ALICIA KOONTZ** in the ASPIRE Program, received 3rd place in the *2025 RESNA Student Scientific Paper Competition*. **LESONG JIA** (University of Pittsburgh), mentored by **DR. BREELYN STYLER**, won the *Best Paper Award* in the User Studies category at the 2025 HRI Conference.

Core Investigator, **DR. ADAM STERCZALA**, received a *Top Cited Article* distinction from the *European Journal of Sport Science* for his 2023 paper *Twelve Weeks of Concurrent Resistance and Interval Training Improves Military Occupational Task Performance in Men and Women*.

Graduate student, **ANDREA SUNDARAM**, defended his PhD dissertation at HERL in March. See *Page 6* for more information on the event.

DRS. JORGE CANDIOTTI and **JON DUVALL** received faculty appointments at the University of Pittsburgh School of Medicine, promoted to Associate Professors.

HERL hosted a number of our peers in the first quarter of the year: the National Defense University's Eisenhower School for National Security and Resource Strategy took their yearly tour of the lab in January, followed by Pitt's Assistant Vice Chancellor for Research in the Humanities, Arts, Social Sciences and Related Fields, Shelome Gooden, Dr. Elizabeth Hsiao-Wecksle from UIUC, Walt Piatt and the Wounded Warriors Project, Permobil, and the MedTechVic Hub team from Swinburne University of Technology in Australia!

Outside of the lab, our researchers attended and participated in the 2025 International Seating Symposium held in March. Attendees not yet mentioned included **DR. SANGMI PARK**, **MATTHEW MESOROS**, **SHANTANU SATPUTE**, **MARCEL OLIART**, **RUTUJA KULKARNI**, and **JESSICA STEINBERG**, as well as REX alumni, **MADDIE WEAVER**.



Qualitative Perspectives from Kinova® Jaco® Robotic Arm Owners: Understanding Daily Device Usage.

We performed a qualitative interview and drew conclusions guided by the HAAT model to better understand interactions between the user, the robotic arm, and contexts of its use for manipulation tasks. The insights gained can better inform prospective owners and guide future research in assistive robotics.

Styler, B; Wang, E; Ding, D. Qualitative perspectives from Kinova® Jaco® robotic arm owners: understanding daily device usage. *Disability and Rehabilitation*. 2025.



Pilot Testing and Validation of an Educational Game on Transportation Challenges for Mobility Device Users

The study introduced HERL-Town, an educational board game to teach community-dwelling MDUs safety and effective navigation when facing ground transportation barriers. The findings demonstrated HERL-Town as a promising educational tool for new MDUs, caregivers/travel companions, and rehabilitation professionals.

Candiotti, J.L.; Park, S.; Lee, C.D.; Rafferty, E.J.; Cooper, R.; Cooper, R.A. Pilot Testing and Validation of an Educational Game on Transportation Challenges for Mobility Device Users. *Disabilities*. 2025





Investigation of Stakeholder Perceptions of the Wheelchair Service Delivery Process

The wheelchair SDP is not viewed as performing well by its stakeholders. Funding, procurement, maintenance, and repairs are viewed particularly negatively, representing opportunities for focused system reform efforts.

Beauregard, T. A.; Schein, R. M.; Berner, T. F.; McKernan, G.; Schmeler, M. R.; Dicianno, B. E.; DiGiovine, C. P. Investigation of stakeholder perceptions of the wheelchair service delivery process. *Disability and Rehabilitation: Assistive Technology*. 2025.

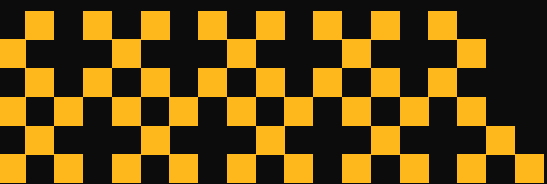


A Survey of Disability and Other Demographics of US Patent Recipients

Although 26% of the US population reports having a disability impacting their daily activities, only about 10% of employed scientists and engineers report having a disability. Inventors with disabilities represented 7% of the respondents of this survey, which is less than, but close to, the percentage of scientists and engineers with disabilities.

Duvall, J.; Daveler, B.; Knox, S.; Cooper, R. A. A SURVEY OF DISABILITY AND OTHER DEMOGRAPHICS OF US PATENT RECIPIENTS. *Technology and Innovation*. 2025.





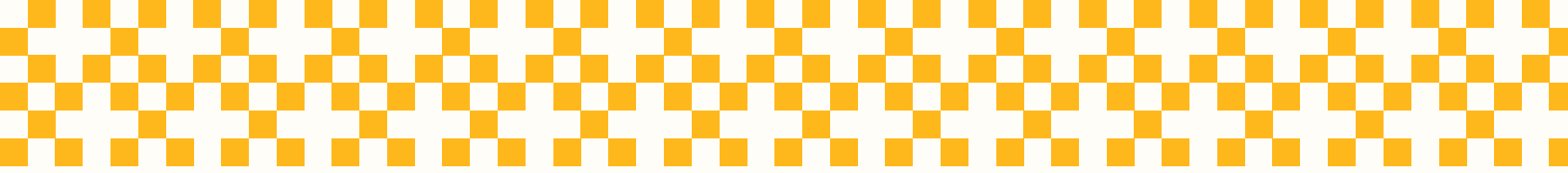
HERL SPOT LIGHT

WHO IS **ANDREA SUNDARAM?**

Andrea successfully defended his PhD dissertation on the *Manual Wheelchair Virtual Coach* in March. He has been at HERL for eleven years and this is what he had to say about it:

"Thanks to my friends being willing to suffer through several practice sessions, I think it went off well. I'm certainly relieved to have passed that milestone and be on the way to graduation."





BY THE NUMBERS

OUR PROGRESS THIS YEAR

- 3** prestigious science, engineering, and athletics awards received.
- 5** manuscripts published in respected, peer-reviewed journals. 3 more accepted.
- 1** patent awarded by the USPTO.
- 14** lectures and visits from distinguished peers and organizations to our lab.
- 1** research grant web portal published: RERC - Power of Play.
- 8** individual scholarships for Veterans funded.

IN 2025, WE'VE PRESENTED LECTURES AND RESEARCH ACROSS

- 2** continents
- 3** countries
- 5** American states + the District of Columbia

RUMINATION OF THE QUARTER

"WHAT TRULY MAKES HERL **SPECIAL** IS THE **COLLABORATION, CREATIVITY, AND SHARED PASSION** FOR MAKING A REAL DIFFERENCE. IT'S INSPIRING TO BE PART OF A TEAM THAT'S CONSTANTLY **PUSHING BOUNDARIES** AND REIMAGINING WHAT'S POSSIBLE."

- Nikitha Deepak
Assistant Director for Clinical & Regulatory Affairs

Recruiting 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.

1 ACCESSIBLE AIRLINE TRANSPORTATION FOR MOBILITY DEVICE USERS: SURVEY



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.

2 SOCIALLY CONNECTED EXERCISE SYSTEM FOR WHEELCHAIR USERS



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

Study Requirements: Age between 18 and 70, use a wheelchair as their primary means of mobility, have only the use of their upper limbs for exercise, have adequate upper limb strength and function.

3 TRANSPORTATION AND NEIGHBORHOOD ACCESSIBILITY IN PITTSBURGH



Purpose: To assess community members' knowledge of transportation and neighborhood accessibility in Pittsburgh.

Study Requirements: You will be asked to complete questionnaires regarding transportation and accessibility of Pittsburgh, as well as provide feedback on them. Completing all questionnaires will take approximately 20 minutes.

4 TRANSPORTATION OF EMERGING ADULT AGED MOBILITY DEVICE USERS



Purpose: To understand barriers young adults face while using various modes of transportation. This research will play a critical role in the development of an innovative game researchers at HERL are developing.

Study Requirements: You will be asked to participate in an interview to provide your experiences and perspectives accessing and utilizing transportation services in your community.

5 ASSESSING THE CAREGIVER ASSISTED TRANSFER TECHNIQUE (CATT) INSTRUMENT



Purpose: To validate the caregiver Assisted Transfer Technique Instrument, a new tool to assess the assisted transfer performance of individuals with disabilities and their caregivers.

Study Requirements: The study takes place over two visits in your home or our lab (your choice), each visit is no longer than two hours.

6 POWERED PERSONAL TRANSFER SYSTEM (PPTS): FOCUS GROUP



Purpose: To study the design of controls to better meet user needs of a robotic, independent-use, Group 3 Powered Personal Transfer System.

Study Requirements: You will be asked to watch a PPTS demonstration video and provide group feedback. The focus group will take no more than two hours.

7 AIRPORT MANUAL WHEELCHAIR: FOCUS GROUP



Purpose: To design a manual wheelchair tailored for airport use, addressing the current practice of airlines requiring wheelchair users to travel in regular passenger seats which poses significant challenges.

Study Requirements: Participation will take no more than two hours.

8 DEVELOPMENT AND EVALUATION OF THE PPAL BEDSIDE COMMUNE



Purpose: To evaluate the PPAL, a new powered bedside commode that facilitates level transfers between a wheelchair or bed and commode seat, reducing effort on the person and their caregivers.

Study Requirements: The study requires one in-person visit during which the participant will be asked to perform a series of transfers with the PPAL and complete surveys and an interview about your experience.

9 BONE HEALTH IN INDIVIDUALS WITH SPINAL CORD INJURY



Purpose: To learn about the connection between Irsin (muscle-secreted bone mediating protein) and bone health in individuals with spinal cord injury (SCI).

Study Requirements: You will be asked to spend five hours, split amongst two days, performing various exercises and completing questionnaires.

10 EVALUATION OF POWERED EXOSKELETON FOR VETERANS WITH KNEE OSTEOARTHRITIS



Purpose: To compare the performance of the Keeogo knee stress-relief powered exoskeleton to a passive knee brace in people with knee osteoarthritis (OA).

Study Requirements: The study requires the participant to answer questions and perform tasks during two separate visits to HERL.

QUESTIONS?

CONTACT

William Schoy

RESEARCH PARTICIPANT ADVOCATE

wjs43@pitt.edu
(412) 822-3675

In the News

JANUARY 2



Empowerment and Innovation

A conversation with Dr. Rory Cooper.

MISSION POSSIBLE

JANUARY 7



UCUSR Annual Report

HERL is featured as a critical research center and also appears in the annual recap video.

IT'S POSSIBLE @ PITT

FEBRUARY 4



The Wizard of Wheelchairs

How Paralympics champ, Rory Cooper, became the Wizard of Wheelchairs.

INVESTOR'S
BUSINESS DAILY

JANUARY 6



Meet the Executive Committee

Dr. Cooper introduced as a member of the 2025 USOPA Executive Committee.

THE OLYMPIAN &
PARALYMPIAN

JANUARY 17



Pittsburgh's Perch in Robotics

Pittsburgh's Perch as Robotics Cradle has been Decades in the making. HERL is featured.

DIGITAL CxO

FEBRUARY 24



Meet Rory Cooper

A Half of Fame innovator who's been harnessing tech to build better wheelchairs.

PITTWIRE

MARCH 1

Porträt von Rory Cooper

A portrait of the American scientist and wheelchair developer.

PARAPLEGIKER

PRINT ONLY

SAVE THE DATE

APRIL 4

**AMSA student
research fair.**



APRIL 1-6

**VA Winter Sports
Clinic.**

APRIL 10-12

**Buckeye
Wheelchair
Games.**

APRIL 18

**State of the
Science
Symposium.**

MAY 4

**Pittsburgh
Marathon.**

MAY 17

**Easterseals'
Walk With Me
Pittsburgh.**

MAY 18

**Rush to Crush
Cancer.**

MAY 19

REX begins.

JUNE 14

**Army 250th
anniversary.**

—

**Highmark's Walk
for a Healthy
Community.**

Photo Gallery

Left to right, top to bottom: Jackson at the Invictus Games in Vancouver; Andrea and his father celebrating; a British man meets Dr. Cooper for the first time; the team tests the board game at Sunrise Medical; Josh helps athletes set up at the Keystone Games; the MedTechVic Hub team after their visit; Dr. Cooper with students from Hopkinton Public Schools; three great photos from the NDU visit taken by Debbie and Victoria; the team welcomes Jackson back after his Invictus Games wins; the Timor-Leste version of HERLTown being tested.





HUMAN ENGINEERING RESEARCH LABS

19  94

MORE THAN THIRTY YEARS OF INNOVATION
FROM THE WORLD



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herl.pitt.edu

6425 Penn Ave
Suite 400
Pittsburgh, PA
15206

herl@groups.pitt.edu