HERL: Human Engineering Research Laboratories

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AI for Good Summit

RORY COOPER SPEAKS AT THE UNITED NATIONS

Excerpt from PittWire by Nick France - July 15, 2025

The University of Pittsburgh's Rory Cooper spoke at the United Nations as part of the AI for Good Global Summit in Geneva, Switzerland, on July 9. The esteemed Pitt innovator discussed how artificial intelligence is being deployed to fuel collaboration and improve the lives of people with disabilities, along with the challenges and ethical considerations of using AI in rehabilitation engineering.

Cooper's talk highlighted several pieces of technology developed in the Human Engineering Research Laboratories (HERL), a joint venture between Pitt and the U.S. Department of Veterans Affairs. Cooper is the founding director and VA Senior Research Career Scientist at HERL and serves as Pitt's assistant vice chancellor for research for STEM-health sciences collaborations.

The presentation featured a wheelchair that can traverse bumps, curbs and icy surfaces while keeping its user upright, a board game that teaches players about community mobility for mobility device users, a virtual coach that helps teach wheelchair users to use powered seat functions in real time, and the affordable, light-weight and fashionable Kirigami wheelchair.

Cooper has been using applied science to aid disabled veterans and other wheelchair users — both groups in which he counts himself — for more than 30 years. In addition to directing HERL, Cooper was elected to the National Academy of Engineering Class of 2024 and named to the U.S. Olympians and Paralympians Association's Executive Committee the same year. In 2023, he was awarded the National Medal of Technology and Innovation and was inducted into National Inventors Hall of Fame.

AI for Good is the United Nations' leading platform on artificial intelligence to solve global challenges. The summit is organized by the International Telecommunication Union in partnership with over 40 UN Sister Agencies and co-convened with the Government of Switzerland.

Accolades & Events

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

Director Dr. Rory Cooper spoke at the July AI for Good Summit in Geneva and the AI Horizons panel on Military Medicine, right here in Bakery Square in September! He was a keynote speaker at the 2025 American Society of Biomechanics conference in August, and presented a lecture on Inclusion and Transformative Technologies at the 2025 disABILITY Conference in September. Associate Director for Stakeholder Engagement, ROSEMARIE COOPER, also gave a lecture at the event, where they were both recognized for their contributions by the state of Pennsylvania. Dr. Cooper has moved on to the National Veterans Creative Arts Festival finals with his entry in the B&W Photo category. Medical Director, DR. BRAD DICIANNO, was lauded with the CLASS Community Hero Award, which will be presented in October. He gave lectures at the VA Advanced Platform Technology (APT) Center in July, and the Lund University Spina Bifida conference as well as the Disability Pride PGH 2025 festival in September. Senior Associate Director for Research, DR. ALICIA KOONTZ, gave a presentation at the PVA Summit in August along with staff researcher, DR. SHANTANU SATPUTE, and at the VAPHS 18th Annual Best Practice Conference in September. Student researchers OWEN FLAUGH, JEFFREY PETTIGROW, also presented their work at the VAPHS event. Core Investigator, DR. GEORGE WITTENBERG, presented at NERD Hour in July, and the CMU Neuro-design Seminar in September.

As a team, the Human Engineering Research Labs participated in and attended a vast array of events this quarter. This included the National Veterans Wheelchair Games in July, the PVA Summit in August, and the AI Horizons Summit, UPMC Wheelchair Rehab institute Wheelchair Wash, Disability Pride PGH, and Steelwheelers 5k—where Drs. Cooper and Sivakanthan came in 3rd in their respective categories—in September. The labs also hosted a variety of events, like our annual Research Experience (REx) Symposium and Open House in July (FEATURED IN OUR PREVIOUS NEWSLETTER), and a showcase event co-hosted with Google in August followed by a group of visitors from the American Society of Biomechanics conference. HERL alum, ERIC SINAGRA, earned a Pitt School of Health And Rehabilitation Sciences Distinguished Alumni award.

Student researcher, RUTUJA KULKARNI, had her first primary author manuscript published in August, followed by her second one in September! DRS. SANGMI PARK and Brad Dicianno published manuscripts in July, followed by DR. BREELYN STYLER in August.

Our progress this year:

- 9 prestigious science, engineering, and athletics awards received.
- 12 manuscripts published in respected, peer-reviewed journals.
- 2 patents awarded by the USPTO, and Germany, France, UK.
- 26 lectures and visits from distinguished peers and organizations to our lab.

- 8 scholarships for Veterans funded.
- 28 media features of our research.

In 2025, we've presented lectures and research across:

- 2 continents
- 4 countries
- 6 American states + the District of Columbia

Publications (Manuscripts)

Gamifying Education on Addressing Real-world Barriers, Obstacles, and Challenges Commonly Encountered by Mobility Device Users

Despite significant improvements in the built environment over the past 30 years, barriers and obstacles still make navigating accessible environments challenging. To address this gap in training, essential skills were identified and gamified into an educational board game called HERL-Town.

Distance Traveled by People Using Permobil Power Wheelchairs Based on Large Data Analytics

Data logging technologies have been implemented in manual and power wheelchairs (PWCs) to measure device performance and user behaviors. Previous studies have investigated mean daily distance traveled in both types of wheelchairs, however, with small sample sizes and limited time frames. Permobil instrumented its PWCs with connectivity to continuously collect usage data.

Evaluation of a Vision-Guided Shared-Control Robotic Arm System with Power Wheelchair Users

Wheelchair-mounted assistive robotic manipulators can provide reach and grasp functions for power wheelchair users. This in-lab study evaluated a vision-guided shared control (VGS) system with twelve users completing two multi-step kitchen tasks.

Psychosocial Impact of Mobility Assistive Technology on Women Veterans

Despite the growing number of women Veterans with disabilities, data on how well mobility assistive technology (MAT) meets their needs are limited. Evaluating psychosocial impact is key to ensuring that MAT not only meets physical needs but also fosters social participation, mental well-being, and independence.

Validation of Inertial Measurement Units for Measuring Lower Extremity Kinematics during Squat-Pivot and Stoop-Twist Lifting Tasks

The purpose of this study is to evaluate the agreement between OMC and inertial measurement units (IMUs) for quantifying joint kinematics during squat–pivot and stoop–

twist lifting tasks. Ten unimpaired adults wearing both IMUs and OMC markers performed 24 lifting trials.

Peer Review of Federal Aviation Administration Research on the Effect of Passenger Seat Pitch and Width on Aircraft Cabin Evacuation Efficiency

An ad hoc committee will conduct a peer review of the Federal Aviation Administration's (FAA's) report and accompanying data, including videos, documenting tests performed during 2019 and 2020 to determine the effect of passenger seat pitch and width on the egress time of cabin occupants during an emergency evacuation of a commercial airplane.

HERL Spotlight

Robert Powell, Cesar Hernandez, and Gavin Davidson demonstrated outstanding presence of mind and courage during a medical emergency at the Human Engineering Research Laboratories. When their colleague collapsed and became unconscious from a severe seizure, they immediately assisted with rendering aid and emergency communications.

Through their quick and decisive actions, our machinists and engineers safeguarded the life of their colleague and exemplified the highest traditions of service, responsibility, and teamwork. These actions reflect great credit upon them, the Human Engineering Research Laboratories, the Department of Veterans Affairs, and the University of Pittsburgh.

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.

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.

Guidelines for Powered Wheelchair and Commercial Airplane Compatibility

Purpose: This small group interview aims to identify the needs and challenges of power wheelchair users (PWUs) in air travel.

Study Requirements: Participate in an interview to share your experiences and perspectives accessing and utilizing air travel-related services.

Clinical Limits of Use Tools (CLOUT) Off-Road Mobility Devices

Purpose: To develop clinical limits of use tools (CLOUT) for off-road wheelchairs and hand cycles to ensure their safe operation.

Study Requirements: Participate in one visit lasting up to 4 hours to conduct performance testing and mapping of the features of an off-road wheelchair or hand cycles.

Virtual Peer Coaching in Manual Wheelchair Skills

Purpose: To determine the effectiveness of virtual coaching from a peer to improve manual wheelchair skills.

Study Requirements: Six, weekly peer coaching sessions via Zoom to improve wheelchair skills, access to a library of wheelchair skills training videos, and completion of questionnaires before and after training.

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.

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.

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.

Questions?

Contact William Schoy – Research Participant Advocate
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William's Corner

Insights from our participants.

The Human Engineering Laboratories (HERL) has been a touch stone for me since its inception. I have personally and professionally worked with many of her old staff, students, and researchers, and have been delighted to be a part of this group.

Unlike most university based research programs many of the staff, administration, and students are made up of qualified individuals from the population it serves, people with disabilities. That consumer control provides inherent quality assurance that I think other research programs lack. Why is that so important? I think it's important because they incorporate people with disabilities through stakeholder inclusion and engagement in addition to faculty, staff and students.

When my son says "What did you do today Mom?" I respond by saying "I did a little research!" I get to help steer the ship that is research. If you want to feel a part of what's happening, know what's on the leading edge in technology, then be part of a stakeholder group at Human Engineering Research Laboratories.

Because HERL has both types of experts, disabled and not disabled. There's a blend between reality and possibility. I see their programs beginning with thoughts, ideas, and what ifs being turned into prototypes, trials and projects. Support HERL by becoming part of their stakeholder engagement groups. Help steer the ship.

- DJ STEMMLER

Photo Gallery

Left to right, top to bottom: The HERL team at the AI Horizons event in Bakery Square; Dr. Cooper with athletes at the National Veterans Wheelchair Games; Dr. Duvall and Eric Sinagra at the award ceremony; the HERL team at the Steelwheelers 5k in North Park; Drs. Sangmi park and Jorge Candiotti with their Summer students; Josh Marino with the TeraBridges High School robotics team after their visit to the labs; the panelists for the AI Horizons talk on Artificial Intelligence in Veteran and Military Medicine including Dr. Siva Sivakanthan as moderator; Rosi and Dr. Cooper pose with their awards for speaking at the 2025 disABILITY conference; the HERL team with the president of the PVA at the PVA Summit; Dr. Breelyn Styler demonstrating her research at a Google demo event; Rosi and Dr. Cooper with Congressman Chris Deluzio and Senior Vice Chancellor for Research, Rob Rutenbar.

In the News

Rory Cooper speaks at the UN – July 15

Rory Cooper spoke at the United Nations as part of the AI for Good Global Summit in Geneva.

Club Lily and HERL Collaborate – July 23

HERL joined participants at Club Lily Summer Camp to research the use of newly developed pneumatic wheelchairs.

Rehabilitation Technology Research on Display for Congressional Visit – July 28

Pitt hosted U.S. Representative Chris Deluzio for a tour of the UPMC Vision Institute to see demonstrations of a wide range of ongoing physical rehabilitation research projects.

IPC announces Paralympian Rory A. Cooper as VISTA 2025 keynote speaker – August 25

Announced as the second keynote speaker for December's VISTA 2025 Conference in Cairo.

FEATURED MANUSCRIPT

1-in-5 Women Veterans say mobility aids don't meet their needs – August 27

More than two million Women Veterans have experienced disabilities requiring a mobility device.

How to Get the Best Wheelchair Setup for Your Lifestyle – September 5

Three longtime experts in the wheelchair industry, including Dr. Rory Cooper, answer your questions.

Save the Date

October 4

Hail to Heroes Pitt Football Game

October 10

Army 10-Miler

October 20

Global Innovation Summit event at HERL

October 27

Marine Corps Marathon

October 28

CLASS Awards Dinner

November 11

Veterans Day

December 7-12

11th VISTA Conference

Our Partners

National Institute on Disability, Independent living, and Rehabilitation Research; Paralyzed Veterans of America; U.S. National Science Foundation.

Rumination of the Quarter

HERL has been the place where I discovered my passion for rehabilitation engineering and the power research has to change lives. Along the way, I've gained not only technical knowledge, but also friendships, mentors, and life lessons that shaped me as a person. I wouldn't be on the path I am today without the support and opportunities that I've gotten here.

- Rutuja Kulkarni
Research Assistant

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