

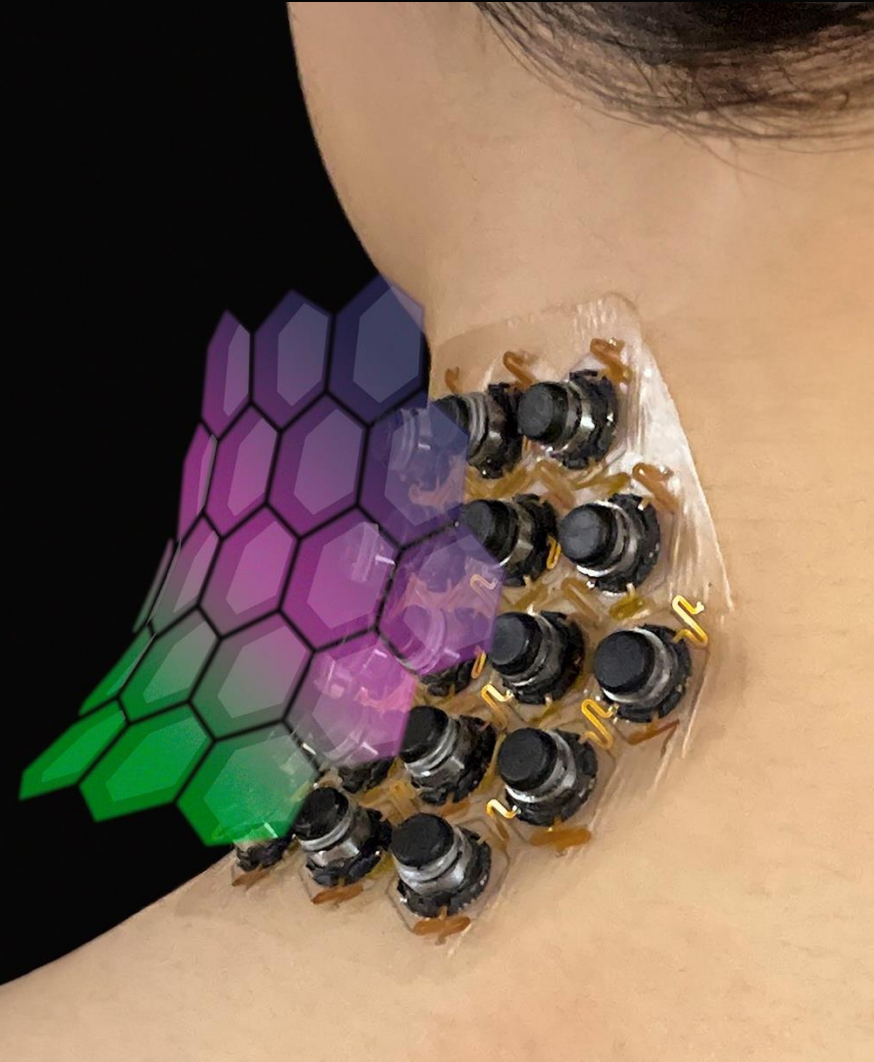
September 15, 2026

Scalable networks of wearable bioelectronics for treating sensory impairments

Matthew T. Flavin, Ph.D.
mflavin@gatech.edu

Sutterfield Family Junior Professor at Georgia Institute of Technology
School of Electrical and Computer Engineering

Flavin Neuromachines Lab
<https://flavinlab.io>

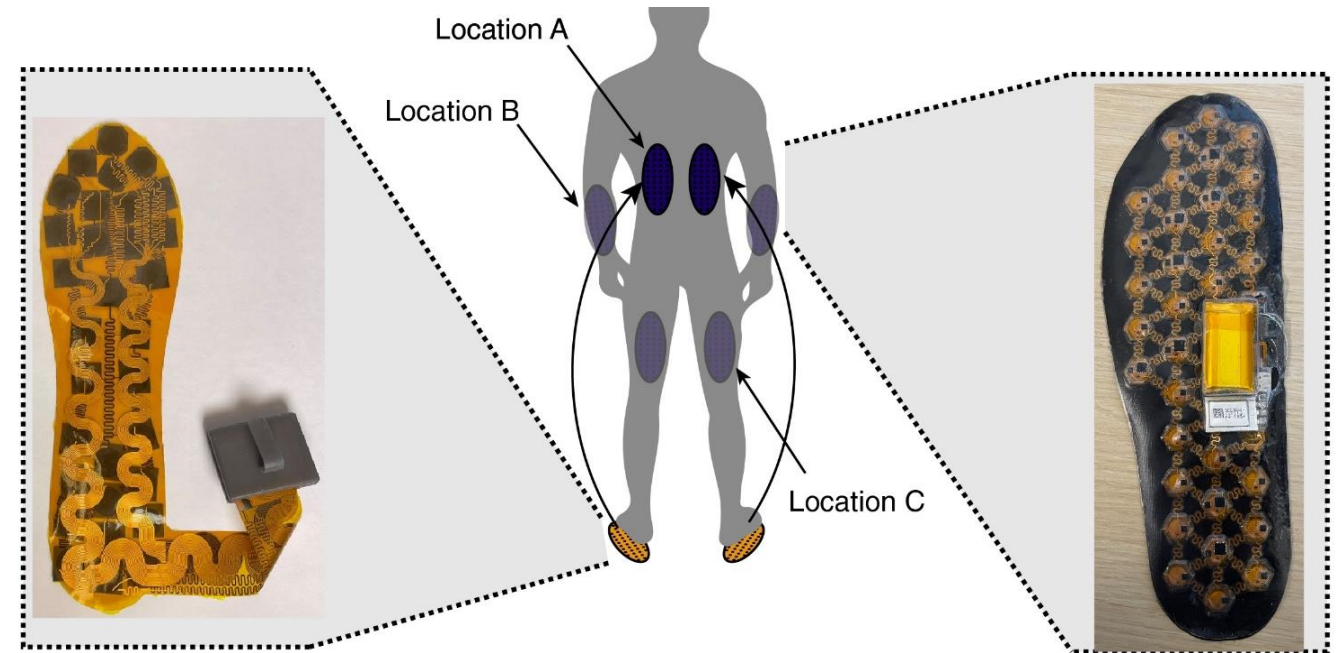


Wearable bioelectronics both monitoring and delivering information

Motivation: Loss of plantar sensation leads to dependence on vision for balance



Sensory substitution with haptic devices tells stroke and spinal cord injury patients when their feet are touching the ground

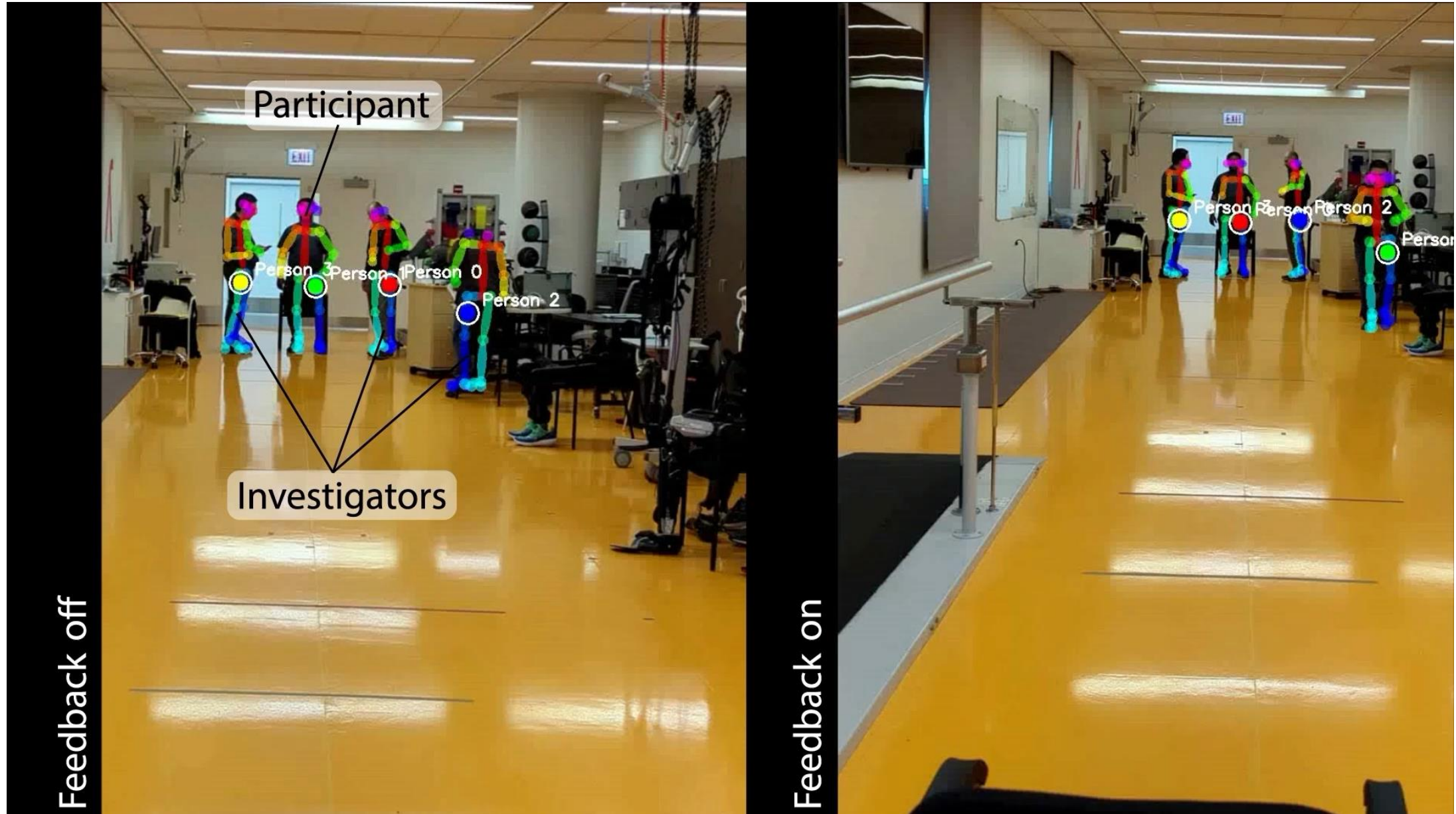


Collaborators

Arun Jayaraman, P.T., Ph.D.
Shirley Ryan AbilityLab

Flavin et al. *PNAS* (2026).

Haptic feedback helps stroke patient walk straight line

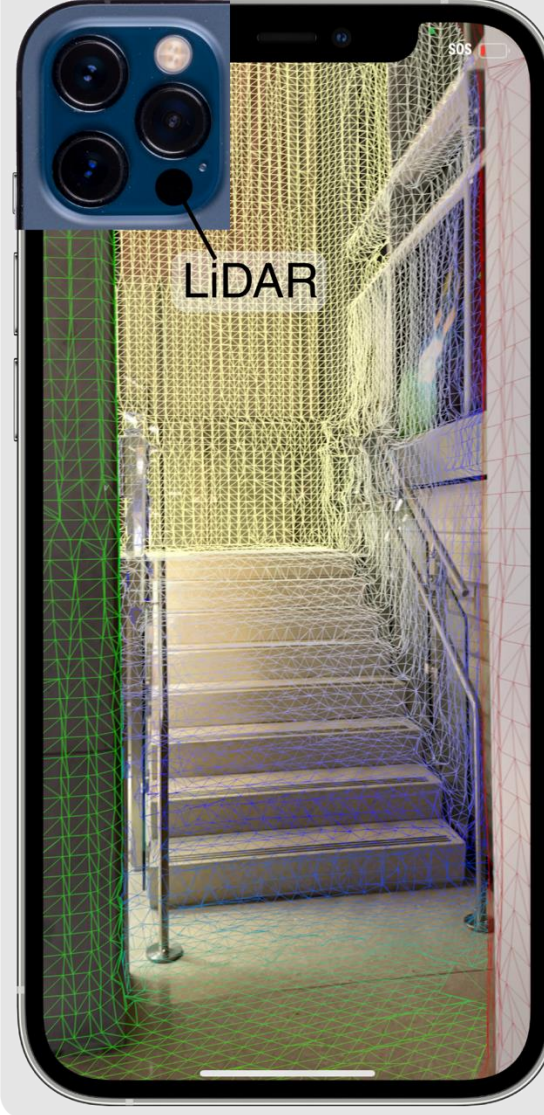


Haptics for visual sensory substitution

Small-scale, low-power electro-mechanical transducer arrays



Scene reconstruction and tracking



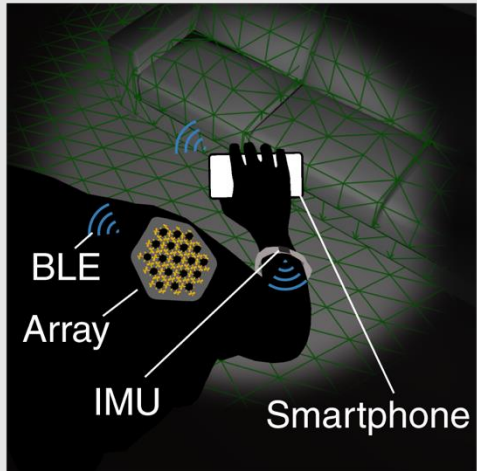
- Created a small-scale, low-power actuator capable of new interactions with skin
- Demonstrated an array of actuators rendering input from virtual and augmented reality systems
- Improved outcomes for models of visual and proprioceptive impairments

Flavin et al. *Nature* (2024).

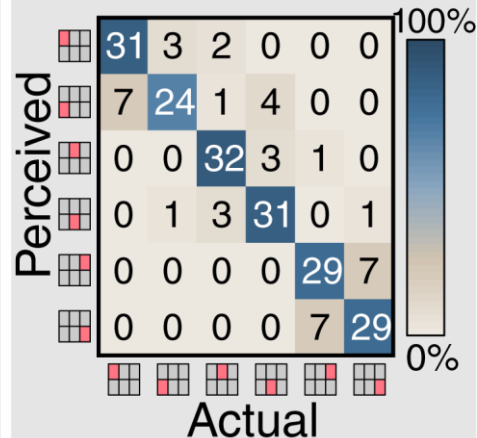
Flavin et al. *PNAS* (2026).

Shin*, Song*, Flavin* et al. *Nature* (2025).

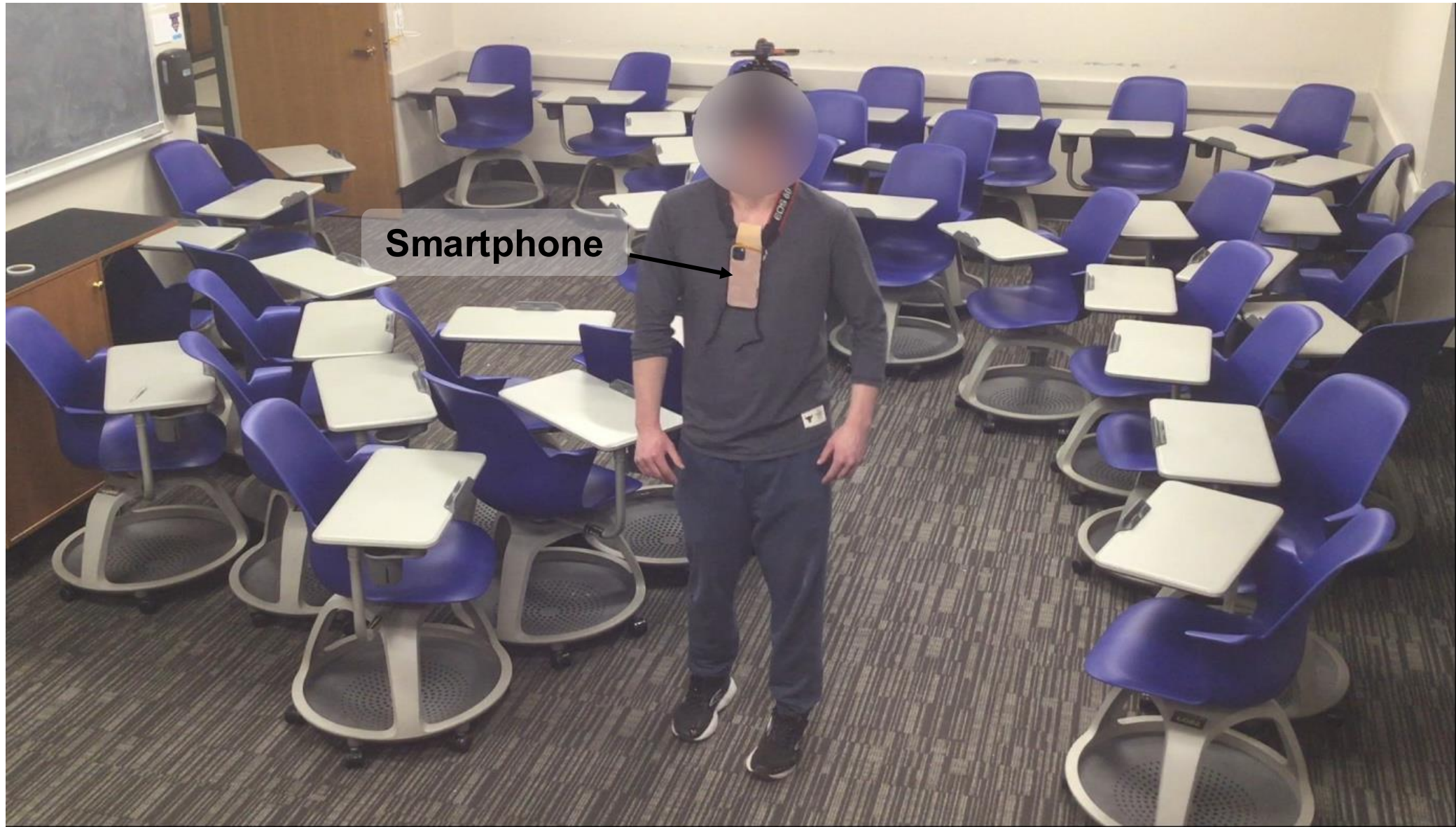
Network of sensors and actuators



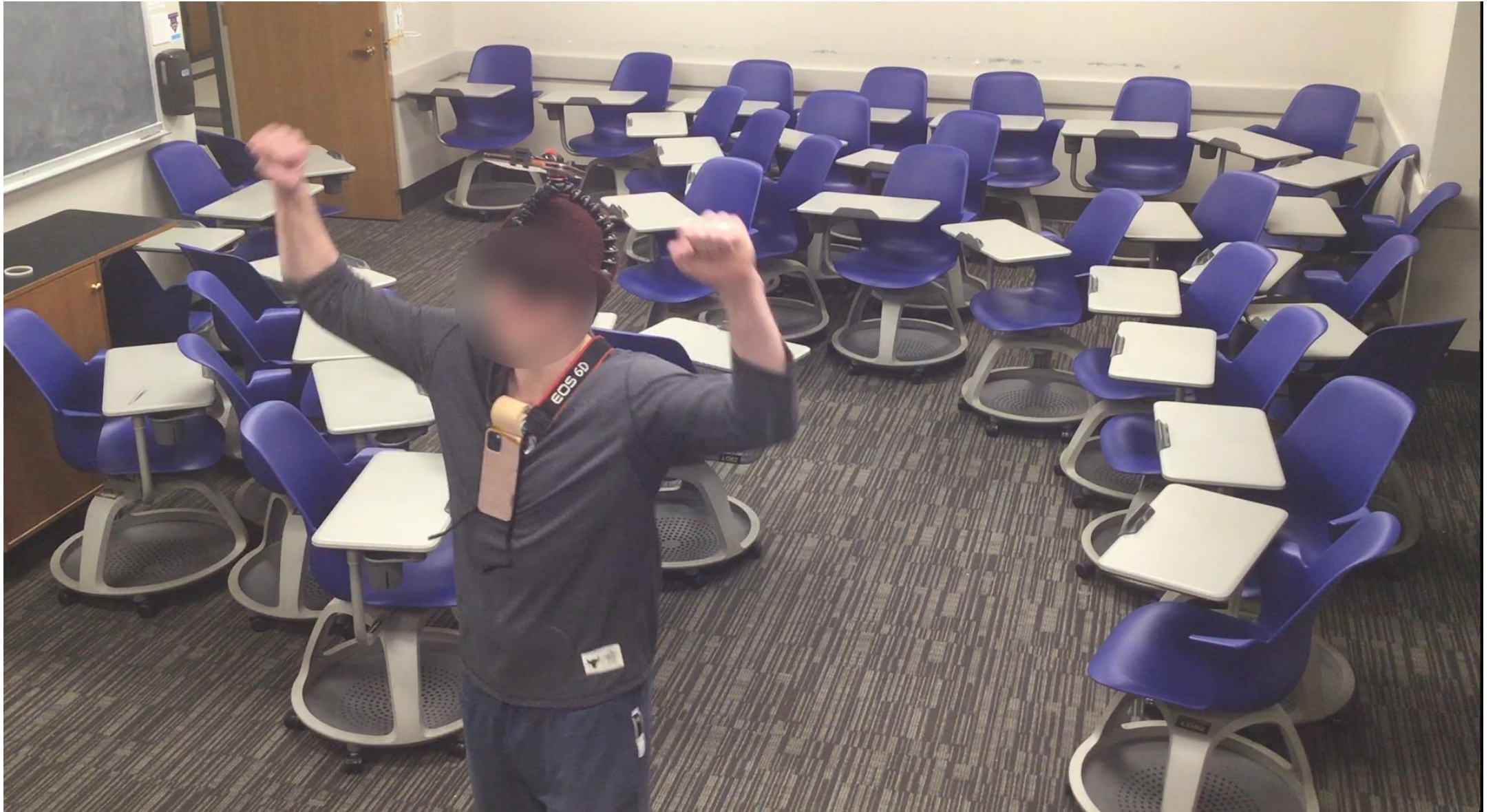
Improvements for visual impairment



Blindfolded subject navigates obstacle course



Blindfolded subject navigates obstacle course



Blindfolded subject navigates obstacle course





Flavin Neuromachines Lab

Postdoctoral researchers

Jeng-Hun Lee

Undergraduate students

Chinmay Bandapalli

Sam Allahverdi

Ethan Huang

Raden Schell

Yanda Chen

Rohan Bala

Hongyi Lyu

William Lu

Raphael Aca

Ayanna Bodake

Graduate students

Aaron Huang

Dulani Wijayarathne

Jinxu Liu

Rhea Soo

Catherine Lacey

Fengyuan Shen

Matt Chung

Jinxin Li

<https://flavinlab.io>



Flavin Neuromachines
Lab at Georgia Tech



Georgia Institute
of Technology

