Assistive Technologies and Rehabilitation

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Research Scientist Good Shepherd Rehabilitation
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LEHIGH UNIVERSITY | Department of Bioengineering

Background

Education

- **Associate Professor,** Lehigh University, Bethlehem PA. 2025 – Present
- **Associate Professor,** University of North Florida, Jacksonville FL. 2018 – 2025
- **Assistant Professor,** University of North Florida, Jacksonville FL. 2013 – 2018
- **Senior Research Associate,** Brown University, Providence RI. 2009 – 2013
- **Postdoctoral Research Associate,** Northeastern University, Boston MA. 2008 – 2009

Areas of Interest

Assistive and Adaptive Technologies, Pediatric Power Mobility, Biomedical Sensors and Stimulators, Biomedical Devices, Human Interface Devices, Neural Prosthetics, Insulating Biomaterials, MEMS, Micro/Nano fabrication, Materials Characterization, Thin Films, Semiconductor processing.

Selected Publications

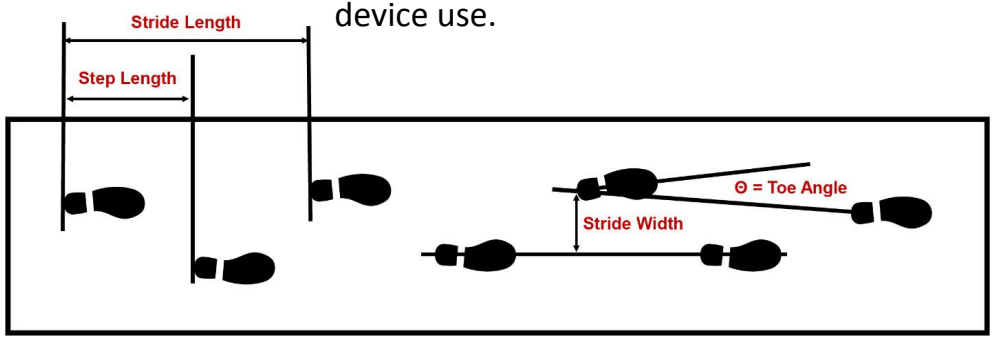
- **Aceros J**, Cesar GM, Rodriguez A, Lundy M (2025). The effects of family directed power mobility on self-care, mobility, and social function in very young children with severe multiple developmental impairments. Frontiers in Rehabilitation Sciences, section Rehabilitation in Children and Youth, 6:1551536. DOI: 10.3389/fresc.2025.1551536.
- Cesar GM, Mochida LY, Flanagan K, McDonald K, Xu J, Depto-Hoffman D, **Aceros JC**. Stand-on ride-on power mobility devices for children with cerebral palsy: Study protocol for pre-post biomechanical changes. BMC Pediatrics. (under review, submitted March 25, 2025).
- K. Flanagan, C. Diaz, G. M. Cesar, and **J. Aceros**, “Integrating Therapy into Play: Stand-On Ride-On for a Child with Cerebral Palsy,” in Proc. IEEE 46th Eng. in Med. and Biol. Conf. (EMBC), Orlando, FL, USA, Jul. 2024, pp. 211-215. doi: 10.1109/EMBC53108.2024.10782546
- **Aceros J** and Lundy M (2020) Enhanced Steering and Drive Adaptations of Modified Ride-On Toy Cars for Improved Directional Control in Very Young Children With Severe Multiple Developmental Impairments. Front. Pediatr. 8:567. doi: 10.3389/fped.2020.00567

Pediatric Power Mobility Devices (PMD)

September January

Stand-On PMD

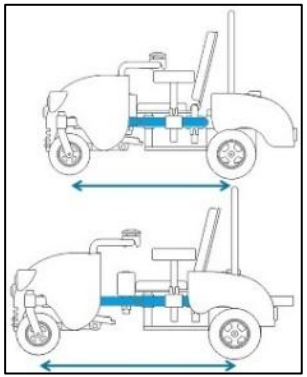
- Children with cerebral palsy (CP) have limited postural control and walking capabilities, leading to delayed development and low quality of life.
- Ride-on power mobility devices allow for the self-generated, active control of mobility. A novel stand-on ride-on device provides an additional support to maintaining upright posture to improve children's balance and lower extremity strength.
- We are studying the biomechanical factors underlying expected changes in balance and mobility function after stand-on ride on device use.



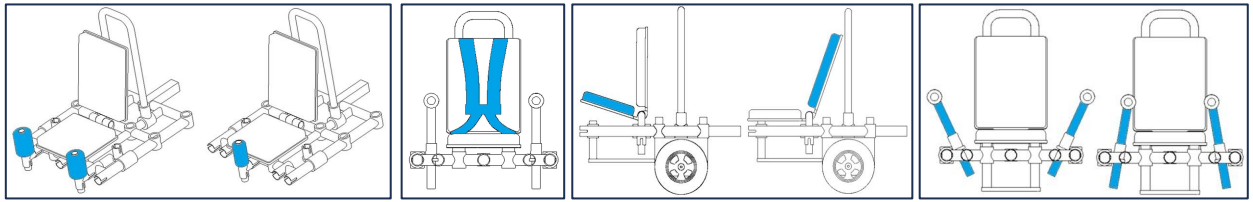
Pediatric Power Mobility Devices (PMD)

MROAD - Modular Ride-On for Adaptive Development

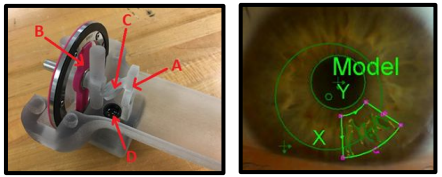
- This project introduces a novel device patented in Dr. Aceros' Lab. The device is a reconfigurable, battery-powered mobility device designed to enhance the freedom and comfort of children and young adults with disabilities.
- The device features a chassis that can connect with various adjustable modules, including drive, seating, harness, armrest, footrest, leg support, body, and control modules. This modular design allows for customization based on the operator's evolving needs, making it suitable for use in therapy, rehabilitation centers, schools, and home settings.



- Patent: US-11836291-B1, "*Apparatus and method for developmental and/or rehabilitative sensory substitution*"
- Patent: US11786418B1, "*Modular Medical Mobility Device*"

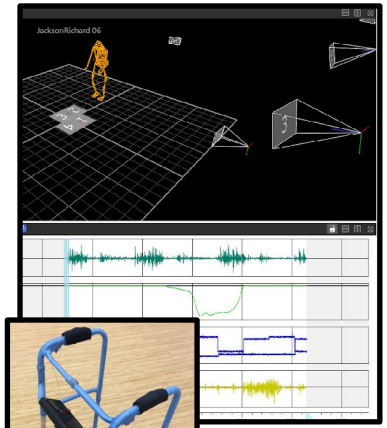


Medical Devices and Assistive Technologies

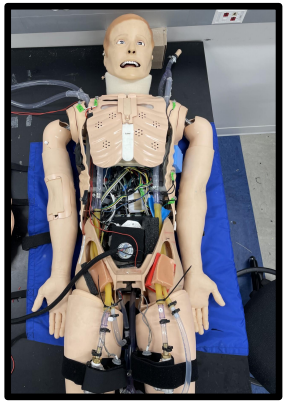


THEIA: Ocular Counter Roll – *Mayo Clinic*

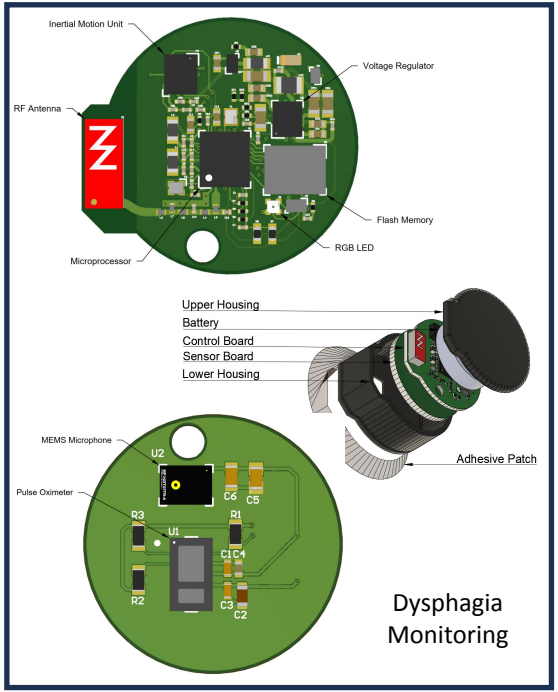
- Our work focuses on two key areas: developing innovative technologies for the rigorous assessment and monitoring of interventions, and creating powerful new tools specifically designed to help individuals with disabilities.



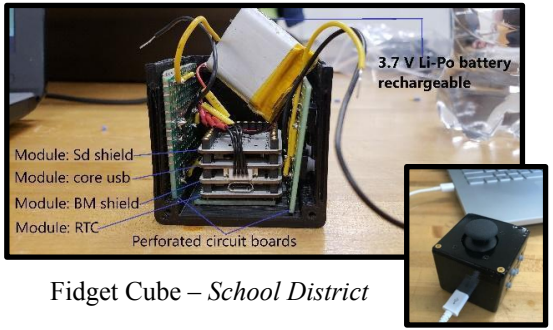
Nexus Smart Walker - *Brooks Rehab hospital*



Extracorporeal Membrane Oxygenation (ECMO) Mannequin – *Mayo Clinic*

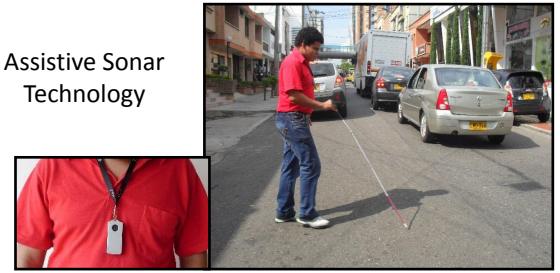


Dysphagia Monitoring



Fidget Cube – *School District*

Assistive Sonar Technology



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Johnson & Johnson

NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development

FPTR Foundation for Physical Therapy Research

NEEC Naval Engineering Education Consortium