

Research 01

A QuickStarGuide for Research at Shirley Ryan AbilityLab



Table of Contents

Introduction	1
Let's Get Started by Bragging a Bit	1
What the Heck is an "Ability Lab?"	3
I'm Ready! How Can I Get Involved?	4
In A Nutshell	4
IdeaLab	4
BuzzLab	4
Roundtables	5
Workshops	5
Catalyst Grant Program	6
Time to Learn the Basics	8
Getting Started	8
Getting Involved	8

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vision is *"to be the global source of science-driven breakthroughs in Human Ability."* This vision

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Let's Get Started by Bragging a Bit

As you might know, we are a **501(c)(3)** non-profit organization. Our mission is to **improve the lives of people with disabilities** through **research, education, and advocacy**. We are currently **seeking funding** to support our **research and development** efforts.

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NURSING FELLOWSHIPS & GRANTS

Registered Nurses and Advanced Practice Registered Nurses may be eligible for funding to support research and scholarship. For more information, please contact the Office of Research and Innovation at the University of Prince Edward Island. For a list of available grants, visit the website at www.upei.ca/research.

Time to Learn the Basics ...

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BIOSKETCH EXAMPLE

The following two biosketches have been used in recent grant submissions.

- x The first was used by Levi Hargrove to obtain a large NIH grant to evaluate osseointegration with implanted electrodes to improve ability for individuals with upper-limb amputation.
- x The second was used by Kristi Turner to apply for a Department of Defense grant to evaluate outcome when using a prosthetic limb.

3. L. Hargrove, S. Zhou, M. J. B. Ostry, and J. R. Granger. "A Robust, Adaptive, and Scalable Control Architecture for a Prosthetic Arm." *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 15(3), 2007. PMID:17518281

4. L. Smith, T. Kuiken, and L. Hargrove. "Time, Simultaneous and Sequential Control of a Prosthetic Arm." *Journal of Neural Engineering*, 11(6), 066013, 2014. PMC4268782

B. Positions, Scientific Appointments, and Honors

Positions, Employment, and Scientific Appointments

Shirley Ryan AbilityLab

- 2017. present Director and Scientific Chair, Center for Bionic Medicine
- 2016. 2017 Associate Director, Center for Bionic Medicine
- 2008-present Research Scientist, Shirley Ryan AbilityLab (previously RIC)

Northwestern University

- 2016. present Associate Professor, Biomedical Engineering
- 2016. present Associate Professor, Physical Medicine & Rehabilitation
- 2015. 2016 Assistant Professor, Biomedical Engineering
- 2014. 2016 Assistant Professor, Physical Medicine & Rehabilitation
- 2008. 2014 Research Assistant Professor, Physical Medicine & Rehabilitation

Other Experience and Professional Memberships

- 2018. present Associate Editor, *IEEE Transactions on Medical Robotics and Bionics*
- 2012. present Founding Partner, Coapt LLC
- 2012. present CDMRP Program Grant Peer Reviewer . PROP.88 oy G(I f JETQ 185.42 315
- 2012. 2013
- 2011. present
- 2011. present
- 2008. present

fact, the focal nature of the intramuscular EMG signal recording could result in reduced performance if the motor unit pool was only sparsely sampled. I completed a set of experiments to show that the system performed equivalently to a system which used surface EMG signals. More recently, we have shown that we can alter our control approaches to take advantage of the more focal recordings and to produce a simultaneous multifunction control system, which is an advance in the field.

- a. L. Hargrove, J. Birdwell, and S. K. Chang, "A Multifunction Control System for a Prosthetic Hand Using Intramuscular EMG Signals," *IEEE Transactions on Biomedical Engineering*, 54:847-853, 2007. PMID:17518281
- b. J. Birdwell, L. Hargrove, and S. K. Chang, "A Multifunction Control System for a Prosthetic Hand Using Intramuscular EMG Signals," *IEEE Transactions on Biomedical Engineering*, 54:847-853, 2007. PMID:17518281

d.

1R44HD110334-01A1 Subaward (Co-I: Turner)

User-centered Design of Digital Health Technology for Clinicians Treating Upper-Limb Myoelectric Prosthesis Wearers

5/17/2023 - 4/30/2025 The goal of this study is to improve the design and implementation of digital health technology in real-world clinical settings for upper-limb prosthesis users and their clinical care providers. The information gathered will be used to design a web-based digital health portal that will contain data and analyses related to upper-limb prosthesis use and performance in their home and community. The web portal will be to assist prosthetists/occupational therapists providing clinical care and provide extended telehealth support to upper-limb prosthesis users.

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2012 - Research Occupational Therapist, Shirley Ryan AbilityLab, Chicago, IL

2012 -

C. Contributions to Science

1. Though outcome measures are needed to evaluate the new control and devices developed in the CBM, I have also been involved in efforts to identify the best outcomes and to refine existing outcomes. In 2019, I was part of an international team to refine the training and evaluation materials for one of the widely used functional measures, the APMC. We continue to refine the measure to be appropriate to properly evaluate new prosthetic components, such as multifunction hands. I continue to work to explore new ways to train prosthetic users, with both body- powered and externally-powered systems, and assess and improve prosthetic function and control.
 - a. Hermansson, L. N., and Turner, K. (2017). Occupational Therapy for Prosthetic Rehabilitation in Adults with Acquired Upper-Limb Loss: Body-Powered and Myoelectric Control Systems. *Journal of Prosthetics and Orthotics* (12).
 - b. L. Hargrove, L., Miller, L., Turner, K.

- b. Sensinger, J., Lipsey, J., Thomas, A., and Turner, K . (2015). ³'HVLJQ DQG HYDOXDWLF
voluntary opening and voluntary FORVLQJ SURVWKHWLF WHUPLQDO GHYLF