Brooke M. Odle, Ph.D.
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brooke.odle@va.gov

CURRENT POSITION

Postdoctoral Fellow (Craig H. Neilsen Foundation)	Department of Biomedical Engineering Case Western Reserve University, Cleveland, OH	2017- Present

EDUCATION

Doctor of Philosophy	New Jersey Institute of Technology and Rutgers University Biomedical and Health Sciences, Newark, NJ Joint Program in Biomedical Engineering Dissertation Title: "Construction and Assessment of a Computer Graphics-Based Model for Wheelchair Propulsion"	2014
Master of Science	New Jersey Institute of Technology, Newark, NJ Biomedical Engineering Thesis Title: "Development of a Toolbox for the Kinematic Evaluation of Hands-Up Video Games"	2009
Bachelor of Science	University of Pittsburgh, Pittsburgh, PA Bioengineering Certificate in Latin American Studies Certificate in International Engineering Minor, Industrial Engineering	2006

PREVIOUS POSITION

Postdoctoral Scholar	Department of Biomedical Engineering Case Western Reserve University Cleveland, OH	2015 - 2017

PUBLICATIONS

Odle, B. M., Lombardo, L. M., Audu, M. L. & Triolo, R. J. "Experimental Implementation of Automatic Control of Posture-dependent Stimulation in an Implanted Standing Neuroprosthesis." *Appl Bionics Biomech* 2019.

Odle, B. M., Reinbolt, J., Forrest, G. F., & Dyson-Hudson, T. A. "Construction and Validation of a Shoulder Model for Wheelchair Propulsion". *Med Biol Eng Comput.* 2018; DOI: 10.1007/s11517-018-1895-z.

Audu, M. L., **Odle, B. M.**, & Triolo, R. J. "Control of Standing Balance at Leaning Postures with Functional Neuromuscular Stimulation following Spinal Cord Injury". *Med Biol Eng Comput.* 2017; DOI: 10.1007/s11517-017-1687-x.

Hunt, A. J., **Odle, B. M.**, Lombardo, L. M., Audu, M. L., & Triolo, R. J. "Reactive Stepping with Functional Neuromuscular Stimulation in Response to Forward-Directed Perturbations". *JNER* 2017; 14:54, DOI 10.1186/s12984-017-0266-6.

CONFERENCE PRESENTATIONS

Under Review

Odle, B. M., Bean, N. F*., Lombardo, L. M., Audu, M. L., & Triolo, R J. "Feasibility of Neural Stimulation to Facilitate Assisted Transfers after Paralysis." Academy of Spinal Cord Injury Professionals 2019 Conference and Expo, Nashville, TN, September 1- 4, 2019.
* denotes student mentee

Odle, B. M., Audu, M. L., & Triolo, R. J. "Posture Adjustment Strategies while Standing with an Implanted Neuroprosthesis." Biomedical Engineering Society 2019 Annual Meeting, Philadelphia, PA, October 16-19, 2019.

Oral Presentations

Audu, M. L., **Odle, B. M.**, Nataraj, R., & Triolo, R. J. "Effect of Stimulation on Non-erect Postures with a Standing Neuroprosthesis." IUPESM 2015 World Congress on Medical Physics & Biomedical Engineering, Toronto, Canada, June 7 – 12, 2015.

Odle, B. M., Forrest, G. F., Reinbolt, J., & Dyson-Hudson, T. A. "Development of an OpenSim Shoulder Model for Manual Wheelchair Users with Tetraplegia." Proceedings of the ASME 2011 International Mechanical Engineering Congress & Exposition, Denver, CO, November 11 – 17, 2011.

Odle, B. M., Irving, A., & Foulds, R. A. "Evaluating Interventions with an Adaptive Video Game Platform for Children with Cerebral Palsy." Rehabilitation Engineering and Assistive Technology Society of North America Annual Conference, New Orleans, LA, pp. 23, June 23-27, 2009.

Odle, B. M., Irving, A., & Foulds, R. A. "Usability of an Adaptable Video Game Platform for Children with Cerebral Palsy." Proceedings of the 35th Annual Northeast Bioengineering Conference at Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA, pp. 73, April 3-5, 2009.

Poster Presentations

Odle, B. M., Alibeji, N. A., Audu, M. L., & Triolo, R. J. "Predicting Interaction Forces between Upper Extremities and Support Devices." 42nd Annual Meeting of the American Society of Biomechanics, Rochester, MN, August 8 - 11, 2018.

Alibeji, N.A., **Odle, B. M.**, Audu, M. L., & Triolo, R. J. "Gait Restoration after a Spinal Cord Injury: A Simulation and Experimental Study of the Double Support Phase." 42nd Annual Meeting of the American Society of Biomechanics, Rochester, MN, August 8 - 11, 2018.

Audu, M. L., Alibeji, N. A., **Odle, B. M.**, & Triolo, R. J. "A Sensor Fusion Algorithm, for Estimating Center of Mass Kinematics in Human Walking after Spinal Cord Injury." 42nd Annual Meeting of the American Society of Biomechanics, Rochester, MN, August 8 - 11, 2018.

Odle, B. M., Audu, M. L., Lombardo, L. M., & Triolo, R. J. "Feedback Controller to Adopt Task-Dependent Postures in a Standing Neuroprosthesis." 41st Annual Meeting of the American Society of Biomechanics, Boulder, CO, August 8-11, 2017.

Odle, B. M., Hunt, A. J., Lombardo, L. M., Audu, M. L., & Triolo, R. J. "Center of Pressure Feedback Control of Posture in an Implanted Standing Neuroprosthesis." 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, Florida, August 17-20, 2016.

Hunt, A. J., **Odle, B M.**, Lombardo, L. M., Audu, M. L., & Triolo, R. J. "Reactive Stepping with Functional Neuromuscular Stimulation in Response to Forward Directed Perturbations." 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Orlando, Florida, August 17-20, 2016.

Odle, B. M., Hunt, A. J., Audu, M. L., Lombardo, L. M., & Triolo, R. J. "Center of Pressure Feedback Control of Task-dependent Postures with an Implanted Standing Neuroprosthesis." North American Neuromodulation Society- Neural Interfaces Conference, Baltimore, Maryland, June 25-29, 2016.

Odle, B. M., Swift, K. M., Irving, A., & Foulds, R. A. "Usability of Training Students to Create Adaptive Video Games for Children with Orthopedic Disabilities." Proceedings of the 34th Annual Northeast Bioengineering Conference at Brown University, Providence, RI, pp 180-181, April 4-6, 2008.

Irving, A., & **Odle, B. M.** "Development of an Adaptable Video Game Platform as a Novel Educational Experience for Children in the Field of Assistive Technology." Proceedings of the 34th Annual Northeast Bioengineering Conference at Brown University, Providence, RI, pp 115-116, April 4-6, 2008.

Koontz, A. M., Yarnall, M., Price, R., **Odle, B.M.**, Sisto, S. A., & Boninger, M. L. "Lateral Transfer Movement Strategies among Persons with Paraplegia." Rehabilitation Engineering and Assistive Technology Society of North America, Phoenix, AZ, June 15-19, 2007.

Odle, B.M., Yarnall, M., & Koontz, A. M. "Upper Limb Joint Kinematics during a Wheelchair Transfer of Persons with Paraplegia." Society of Hispanic Professional Engineers National Technical and Career Conference, Denver, CO, January 10-13, 2007.

Panel Presentations

Mc Calla, L. L., **Odle, B. M.**, Uhuru, A., Guiro, K., Lafond, I., & Mendoza, B. "Beyond Xavier's School for Gifted Youngster's: Teaching Pop Culture in the Pre-College and College Classroom." New York Comic Con, New York, NY, October 4-7, 2018.

Oral Presentations by Student Mentees

Bean, N. F., **Odle, B. M.**, Lombardo, L. M., Audu, M. L., & Triolo, R J. "Augmentation of Caregiver Dependent Transfers with Functional Neuromuscular Stimulation." 2019 Midwest American Society of Biomechanics Regional Meeting, Dayton, Ohio, February 28- March 1, 2019.

Poster Presentations by Student Mentees

Bean, N. F**., **Odle, B. M.**, Lombardo, L. M., Audu, M. L., & Triolo, R J. "Functional Neuromuscular Stimulation to Facilitate Assisted Transfers: A Pilot Study." Rehabilitation Engineering Society of North America 2019 Annual Conference, Toronto, Canada, June 24- June 28, 2019.
** Awarded Honorable Mention in Undergraduate Student Competition

GRANT APPLICATIONS:

Craig H. Neilsen Foundation
Spinal Cord Injury Research on the Translational Spectrum Postdoctoral Fellowship
Proposal Title: "Auto-regulation of Standing Balance after Spinal Cord Injury"
Status: Awarded, 7/31/2017 – 7/30/2019
Amount: $139,724

Paralyzed Veterans of America Education Foundation
2019 Education PROJECT Award
Proposal Title: "Feasibility of Neural Stimulation to Facilitate Independent Transfers after Paralysis"
Status: Approval for Funding (06/01/2019 – 05/31/2020)
Amount: $49,660

INVITED LECTURES:

"Lower Extremity Prostheses" 2/2019
EBME 307: Biomechanical Prosthetic Systems
Case Western Reserve University, Cleveland, OH

"Wheeled Mobility Biomechanics" 1/2019
EBME 307: Biomechanical Prosthetic Systems
Case Western Reserve University, Cleveland, OH

"Predicting the Interaction Forces of the Upper Extremities and Assistive Devices" 9/2018
Engineering Seminar
Hope College, Holland, MI

"Biomechanics of Gait" 5/2018, 12/2016
Didactics Lecture for Physical Medicine and Rehabilitation Residents
MetroHealth Medical Center, Cleveland, OH

"Construction and Assessment of a Computer Graphics-Based Model for Wheelchair Propulsion" 12/2013
BME 791: Biomechanics of Human Movement
New Jersey Institute of Technology, Newark, NJ

TEACHING EXPERIENCE AND PEDAGOGICAL TRAINING:

Expanding Teaching Experiences for Doctoral Students (ExTEnD) Program 8/2017 – 4/2019
Case Western Reserve University, Cleveland, OH

- Completed UNIV 400C: Future Faculty Preparation, a one-semester seminar style class taught

by Educational Student Services to learn the basics of curricular design, development, and delivery
- Gained formal university level teaching experience by completing 5 hours of guest lectures
- Facilitator for MGRD 311/411: Introduction to Clinical Inquiry (Spring 2019)
    - Facilitate inquiry and problem-based discussions on various overarching medical topics (bioethics, public health, health disparities) by group of 7 post baccalaureate students preparing for the MCAT
    - Ensure learning objectives are addressed
    - Encourage students to positively contribute to discussions
    - Provide weekly feedback on student progress to course instructor of record, regarding students' ability to grasp learning objectives, contributions to discussion, professionalism, and attendance
    - Provide formal mid-semester feedback and grades on student participation and performance

Principal Instructor: Biomedical Engineering and Technology Track; STEM and New Thinking 10/2016 – Present
Accelerated Learning Academy, W. E. B. Du Bois Scholars Institute
Princeton University, Princeton, NJ
- Develop curriculum for high-achieving high school students interested in engineering and technology
- Teach curriculum by employing various teaching strategies, such as flipped classroom, project-based learning, and think-pair-share
- Design seminars on the intersection of Science, Technology, Engineering, Mathematics, Ethics, and Social Justice and facilitated them for approximately 50 high-achieving high school students

Instructor
W. E. B. Du Bois Scholars Institute, Princeton University, Princeton, NJ 6/2013 - 8/2014
- Designed courses in "Mathematical Logic," "Mathematical Reasoning," and "Computer Coding and Programming" to rising eighth graders, rising ninth graders, and high-achieving high school students, respectively
- Taught classes using real-world applications, collaborative and interdisciplinary approaches, and hands-on activities
- Provided detailed feedback to students regarding progress, strengths, and areas for growth

National Science Foundation GK12 Fellow 7/2011 – 6/2012
New Jersey Institute of Technology, Newark, NJ
- Served as "resident engineer" in geometry and algebra classes at Saint Vincent Academy
- Prepared and taught lessons under the supervision of classroom teacher
- Taught lessons using educational teaching aids, such as Pixton comics, Vernier equipment, CPS clicker system, Algodoo software, and Prezi

MENTORING EXPERIENCE:
Nicholas Bean (BS/MS Program Candidate, Department of Biomedical Engineering) 5/2018 – Present
Case Western Reserve University, Cleveland, OH
Project: "Augmentation of Caregiver Dependent Transfers with Functional Neuromuscular Stimulation"

Raymond Wang (BS Program, Department of Mechanical Engineering) 1/2017 – 5/2017
Case Western Reserve University, Cleveland, OH
Project Title: "Estimating whole-body center of mass from body-mounted markers"

Ashley Coggins (BS Program, Departments of Mechanical and Biomedical Engineering) 11/2015 – 4/2016
Case Western Reserve University, Cleveland, OH
Project Title: "Estimating whole-body center of mass from body-mounted markers"
Graduate Institution: University College London (MSc in Rehabilitation Engineering and Assistive Technology, Fall 2018)

SERVICE TO INSTIUTION AND PROFESSION
Manuscript and Conference Abstract Reviewer
- Journal of Applied Biomechanics
- Frontiers in Neuroscience
- ASME Journal of Biomechanical Engineering
- IEEE Engineering in Medicine and Biology and Society Meeting

- American Society of Biomechanics (Midwest Regional Meeting)

Letters to a Pre-Scientist 8/2018 – 04/2019

Session Co-Chair, "Clinical Biomechanics and Journal of Biomechanics Award Session," 8/2018
42nd Annual Meeting of the American Society of Biomechanics, Rochester, MN, August 8 - 11, 2018.

Diversity and Inclusion Committee 3/2018 - Present
National Biomechanics Day

Postdoctoral Representative 9/2017 - Present
Faculty Senate Committee on Minority Affairs
Case Western Reserve University, Cleveland, OH

Invited Panelist: Summer Bridge Program "Graduate Student Success" 8/2017
Northeast Ohio Alliance- Alliance for Graduate Education and the Professoriate, Perrysburg, OH

Invited Co-Moderator: "How to Thrive and Finish your Program: When Faculty Say X" 8/2017
15th Annual PROMISE Summer Success Institute: #ThinkBigDiversity, Continuing Graduate, PROMISE-Maryland Alliance for Graduate Education and the Professoriate (University System of Maryland: *Bowie State University*, *Coppin State University*, *Frostburg State University*, *Salisbury University*, *Towson University*, *University of Baltimore*, *University of Maryland, Baltimore*, *University of Maryland, Baltimore County*, *University of Maryland, College Park*, *University of Maryland Eastern Shore*, *University of Maryland University College*), Hanover, MD

Case Western Reserve University Postdoctoral Association
- Committee Member, Professional Development Committee 8/2018- Present
- Chair, Professional Development Committee 8/2017- 7/2018

Distinguished Alumni Speaker: "Differences in Institutional Culture" 5/2017
University of Pittsburgh Swanson School of Engineering
PITT STRIVE Mentor-Mentee Retreat, Wheeling, WV

Reviewer, Shared Equipment Evaluation Program 4/2016
Department of Veterans Affairs

PROFESSIONAL MEMBERSHIPS
American Society of Biomechanics
Institute of Electrical and Electronics Engineers
National Society of Black Engineers (Secretary, North East Ohio Professional Chapter)
National Postdoctoral Association
Girl Scouts of America (Lifetime Member)

HONORS AND AWARDS
Postdoctoral Research Award: First Place Research Poster 5/2018
2018 Research ShowCASE, Case Western Reserve University, Cleveland, OH

Diversity Travel Award 8/2017
American Society of Biomechanics Annual Meeting, Boulder, CO

Third Place: Best Mentor-Mentee Team Award 5/2017
PITT STRIVE Retreat, University of Pittsburgh Swanson School of Engineering

Diversity Travel Award 6/2016
Neural Interfaces Conference, Baltimore, MD

Featured Program Graduate: Exploring New Research Frontiers for Future Generations 10/2015

Institute on Teaching and Mentoring, The Compact for Faculty Diversity

Albert and Toni Roothbert Scholarship 5/2011 - 5/2014

Alfred P. Sloan Foundation Graduate Scholar 12/2010 - 01/2014

Alpha Kappa Alpha Educational Advancement Foundation Graduate Scholarship 10/2010

Alliance for Graduate Education and the Professoriate Summer Research Award 6/2010

Alliance for Graduate Education and the Professoriate Scholar 8/2007 - 1/2014

Master's Fellowship, New Jersey Institute of Technology 8/2007 - 12/2008

Third Place, Technical Poster Competition (Undergraduate) 1/2007
Society of Hispanic Professional Engineers National Technical and Career Conference, Denver, CO

Best Research Presentation Award 4/2006
Pitt Excel Mentoring Program for Engineering Excellence
University of Pittsburgh, Pittsburgh, PA

Denise E. Walden Memorial Award for Service 4/2006
Pitt Excel Mentoring Program for Engineering Excellence
University of Pittsburgh, Pittsburgh, PA