

BLYNN L. SHIDELER III

Medical Student | Biomedical Engineer

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EDUCATION

STANFORD UNIVERSITY

Doctor of Medicine

Concentration: Bioengineering

Career Interests: Surgery, Pediatrics, Medical Devices

Stanford, CA

August 2020 – Present

COLUMBIA UNIVERSITY

Bachelor of Science

Major: Biomedical Engineering

Honors: *Magna Cum Laude*, Tau Beta Pi

Cumulative GPA: **3.97/4.00**

New York, NY

August 2017 – May 2019

WASHINGTON & JEFFERSON COLLEGE

Bachelor of Arts

Majors: Physics & French | Minor: Mathematics

Honors: *Summa Cum Laude*, Phi Beta Kappa, Sigma Pi Sigma, Pi Delta Phi, Alpha Lambda Delta

Cumulative GPA: **3.96/4.00**

Washington, PA

August 2014 – May 2017

MCGILL UNIVERSITY

Visiting Student

French & Quebec Studies

Montréal, Quebec, Canada

July – August 2016

RESEARCH & ENGINEERING

STANFORD PEDIATRIC SURGERY

Medical Student Researcher

Stanford, CA

March 2023 – Present

- * **PI: Stephanie Chao, MD** | Stanford Medicine Children's Health
- Conducting a multi-institutional retrospective study on outcomes in pediatric inguinal hernia repairs
- Collecting patient data and organizing medical records from Lucile Packard Children's Hospital at Stanford

STANFORD PEDIATRIC REHABILITATION TECHNOLOGIES PROGRAM

Program Founder & Research Protocol Director

Stanford, CA

December 2020 – Present

- * **PI: Jennifer O'Malley, MD, PhD & Emily Kraus, MD & Scott Delp, PhD** | Stanford Medicine
- Started a program for pediatric patients at Lucile Packard Children's Hospital to try rehabilitation technologies
- Directed IRB protocol for using electrical stimulation in children with cerebral palsy for improving walking
- Led a team of Stanford engineers to design & launch an Apple Watch technology for pediatric cerebral palsy
- Awarded over \$25,000 in funding from FDA Pediatric Device Consortium grants and Stanford Medical Scholars

NATIONAL INSTITUTES OF HEALTH

Intramural Research Fellow in Rehabilitation Medicine

Bethesda, MD

June 2019 – Present

- * **PI: Diane Damiano, PT, PhD & Thomas Bulea, PhD** | Functional & Applied Biomechanics
- Engineered hardware & software components of the NIH Pediatric Robotic Exoskeleton (P.REX)
- Designed & implemented a custom gait-synchronized electrical stimulation system for exoskeleton interface
- Assisted patient gait data collection for exoskeleton clinical trial ID: NCT01961557
- Designed a pediatric mobility device for infants with movement disorders

COLUMBIA UNIVERSITY ROBOTICS & REHABILITATION

Undergraduate Researcher

New York, NY

October 2017 – May 2019

- * **PI: Sunil Agrawal, PhD** | Robotics and Rehabilitation (ROAR) Laboratory
- Conducted rehabilitation studies for improving walking patterns in pediatric cerebral palsy
- Designed medical robotics, wearable sensors, and virtual reality tools for gait and human movement

VICTORIA UNIVERSITY SCHOOL OF HUMAN MOVEMENT

Visiting Research Fellow

Melbourne, Australia

May – August 2017

- * **PI: Simon Taylor, PhD & Rezaul Begg, PhD** | Institute for Health & Sport
- Designed real-time user interfaces and biofeedback systems in to assist gait rehabilitation
- Collected & analyzed human movement physiological and gait data

HANGZHOU DIANZI UNIVERSITY

Visiting Student of Research in Biomedical Engineering

Hangzhou, Zhejiang, China

May – July 2016

- * **PI: Ming Meng, PhD** | Biomedical Engineering & Instrumentation
- Contributed to the fabrication of a prosthetic hand that functions through surface electromyography (EMG)
- Programmed pattern recognition algorithms to predict wrist kinematics

UNIVERSITY OF PARIS DESCARTES SCHOOL OF MEDICINE

Biomedical Engineering Research Fellow

Paris, France

May – August 2015

- * **PI: Pierre-Paul Vidal, MD, PhD** | Center for Sensorimotor Studies
- Developed gait event-detection algorithms from foot acceleration data for the rehabilitation of abnormal gait
- Collected kinematic and lower limb EMG data from healthy subjects and patients at Saint-Antoine Hospital
- Recognized as the first teenager to ever conduct and present independent research for the Cognition & Action Group

INTELLECTUAL PROPERTY

- [1] **Shideler, B** *et al.* LIMB MOTION TRACKING BIOFEEDBACK PLATFORM AND METHOD OF REHABILITATION THERAPY FOR PATIENTS WITH SPASTICITY. *Trustees of Columbia University in the City of New York*. US Provisional Patent Application US20220211321A1 filed March 23, 2022.
- [2] **Shideler, B** *et al.* REAL-TIME BIOFEEDBACK REHABILITATION TOOL GUIDING AND ILLUSTRATING FOOT PLACEMENT FOR GAIT TRAINING. *Victoria University, School of Human Movement*. US Patent US10,722,149 B2, filed July 26, 2017 published December 21, 2017, issued July 28, 2020

JOURNAL MANUSCRIPT PUBLICATIONS

- [1] Martin, S., Taylor, S.B., **Shideler, B.L.**, Ogrin, R. and Begg, R., 2023. Effects of diabetes mellitus on step length and minimum toe clearance adaptation. *Biomedical Engineering Online*, 22(43), pp1-12.
- [2] Martin, S., Taylor, S., **Shideler, B.**, Ogrin, R. and Begg, R., 2022. Overground gait adaptability in older adults with diabetes in response to virtual targets and physical obstacles. *bioRxiv*, pp.2022-10.
- [3] Berrigan, W., White, W., Cipriano, K., Wickstrom, J., Smith, J. and Hager, N., 2022. Diagnostic imaging of A2 pulley injuries: a review of the literature. *Journal of Ultrasound in Medicine*, 41(5), pp.1047-1059. (**Shideler, B.** Acknowledgement).
- [4] Chen, J., Hochstein, J., Kim, C., Tucker, L., Hammel, L.E., Damiano, D.L. and Bulea, T.C., 2021. A pediatric knee exoskeleton with real-time adaptive control for overground walking in ambulatory individuals with cerebral palsy. *Frontiers in robotics and AI*, p.173. (**Shideler, B.** Acknowledgement).
- [5] **Shideler, B.L.**, Martelli, D., Prado, A. and Agrawal, S.K., 2021. Overground gait training using virtual reality aimed at gait symmetry. *Human Movement Science*, 76, p.102770.
- [6] **Shideler, B.L.**, Bulea, T.C., Chen, J., Stanley, C.J., Gravunder, A.J. and Damiano, D.L., 2020. Toward a hybrid exoskeleton for crouch gait in children with cerebral palsy: neuromuscular electrical stimulation for improved knee extension. *Journal of NeuroEngineering and Rehabilitation*, 17(1), pp.1-14.
- [7] Mehdikhani, M., Taylor, S., **Shideler, B.L.**, Ogrin, R. and Begg, R., 2020. Age effects on step adaptation during treadmill walking with continuous step length biofeedback. *Gait & Posture*, 80, pp.174-177.
- [8] Tucker, L.A., Chen, J., Hammel, L., Damiano, D.L. and Bulea, T.C., 2020. An open source graphical user interface for wireless communication and operation of wearable robotic technology. *Journal of Rehabilitation and Assistive Technologies Engineering*, 7, p.2055668320964056. (**Shideler, B.** Acknowledgement).

[9] Bulea, T.C., Chen, J. and Damiano, D.L., Exoskeleton Assistance Improves Crouch during Overground Walking with Forearm Crutches: A Case Study. In 2020 8th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob) (pp. 679-684). *IEEE*. (**Shideler, B.** Acknowledgement).

[10] Barrois, R., Gregory, T., Oudre, L., Moreau, T., Truong, C., Pulini, A. A., ... and Yelnik, A., 2016. An automated recording method in clinical consultation to rate the limp in lower limb osteoarthritis. *PLoS one*, 11(10), e0164975. (**Shideler, B.** Acknowledgement).

CONFERENCE ABSTRACTS & PRESENTATIONS

[1] **Shideler, B.**, “An Apple Watch assistive technology for children with cerebral palsy” *Stanford Assistive Technologies Faire*, Stanford, California. 2023.

[2] **Shideler, B.**, Kraus, E. and O’Malley, J., “BUDI – an Apple Watch tool for cerebral palsy” *Stanford eWear Seminar Series*, Stanford Wearable Electronics Initiative, Stanford, California. 2022.

[3] **Shideler, B.**, “BUDI: an Apple Watch technology for pediatric cerebral palsy” *Stanford SystemX Alliance Fall Conference*, Stanford Engineering, Stanford, California. 2022.

[4] **Shideler, B.** and Ravi, V., “A Pediatric Rehabilitation Technologies Program at Stanford” *Engineering in Healthcare Industry in Research Symposium*, Ohio State University, Columbus, Ohio. 2022.

[5] **Shideler, B.**, Bulea, T.C., Chen, J., Stanley, C., Gravunder, A. and Damiano, D., “A hybrid exoskeleton for children with cerebral palsy” *National Institutes of Health Post Baccalaureate Seminar Series*, Bethesda, Maryland. 2020.

[6] Mehdikhani, M, Taylor, S, Begg, R, **Shideler, B.**, Ogrin, R, “A flexible real-time biofeedback tool that trains gait adaptability,” *World Congress of the International Society of Biomechanics*, Calgary, Canada. 2019.

[7] Mehdikhani, M, Taylor, S, **Shideler, B.**, Ogrin, R, Begg, R, “Aging and diabetes’ effects on gait adaptability during treadmill walking,” *Institute for Health and Sport Student Symposium for Higher Degree Research*, Melbourne, Australia. 2019.

[8] Mehdikhani, M, Taylor, S, **Shideler, B.**, Ogrin, R, Begg, R, “The effect of diabetic peripheral neuropathy on step imprecision in response to step targets and obstacles in older people,” *International Society of Prosthetics and Orthotics 17th World Congress*, Kobe, Hyogo, Japan. 2019.

[8] Mehdikhani, M, Taylor, S, **Shideler, B.**, Ogrin, R, Begg, R, “A new computer program for gait training of people with lower limb prostheses,” *Australian Orthotics and Prosthetics Congress*, Melbourne, Australia. 2019.

[9] **Shideler, B.**, Meng, M, and Gui, Q, “Predicting wrist kinematics for prosthetic limbs using sEMG signals and muscle synergy theory,” *Western Pennsylvania Undergraduate Biology Symposium*, Washington, PA. 2016.

[10] **Shideler, B.**, Bukowitz, R, Steffes, R, and Reiss, T, “International Internships,” *University of Pittsburgh Three-Rivers Re-Entry Conference*, Pittsburgh, PA. 2016.

[11] **Shideler, B.**, Xu, A, and Wong, R, “Differential Growth Models,” *Mathematical Association of America Allegheny Mountain Section Meeting*, Gannon University, Erie, PA. 2016.

[12] **Shideler, B.**, Meng, M, and Vidal, PP, “Les Accéléromètres dans la Recherche du Gait,” *l’École Normale Supérieure Centre de Mathématiques et Leurs Applications Quarterly Meeting*, Paris, France. 2015.

VOLUNTEERING EXPERIENCE

STANFORD FLU CREW

Medical Student Volunteer

Stanford, CA

September 2020 – Present

- * Program Director: Patricia Fast, MD, PhD | Stanford Pediatric Infectious Disease
- 200 hours of service, volunteering and delivering the influenza & COVID-19 vaccines at community events
- Educating local underprivileged areas about COVID-19 & vaccinations

CALIFORNIA CHILD SERVICES THERAPY UNITS

Medical Student Volunteer

San Mateo, CA

November 2020 – June 2021

- * Director of Rehabilitation Services: Jennifer McLean, MS, OTR/L | California Child Services
- 50 hours of service, assisted & shadowed rehabilitation services
- Observed care coordination of physical, occupational, recreational, and speech therapy services

ROCKVILLE HIGH SCHOOL WRESTLING COACH

Varsity Wrestling Coach

Rockville, MD

September 2019 – March 2020

- * Athletic Director: Michael S. Hayes | Montgomery County Schools
- 500 hours of service, volunteered one season as the varsity wrestling coach
- Coached athletes at the 2020 Maryland AA State Wrestling Championships

MOUNT SINAI ST. LUKE'S HOSPITAL

Volunteer—Emergency Department

New York, NY

October 2017 – May 2019

- * Supervisor: Amy Bush | Department of Volunteer Services
- 200 hours of service, volunteered weekly at St. Luke's Hospital in Adult and Pediatric Emergency Medicine
- Observed physician-patient interactions, assisted non-clinical tasks of the emergency department

BUSINESS EXPERIENCE

BUDI: APPLE WATCH TECHNOLOGY FOR PEDIATRIC CEREBRAL PALSY

Stanford, CA

Founder & Lead Inventor of BUDI

January 2018-Present

- Filed a US Patent Application with Columbia Technology Ventures a method of upper limb rehabilitation
- Led a team of Stanford engineers designing iOS/watchOS user interface with Google Cloud data backend
- Appointed as mentor for Stanford Byers Center for Biodesign Building for Digital Health Course
- Awarded project funding through the FDA Pediatric Device Consortium (grant no. P50FD006424)
- Launched website & Apple Watch/iPhone application on Apple App Store via TestFlight, June 2022

STEVE BLANK'S LEAN LAUNCHPAD AT COLUMBIA BUSINESS SCHOOL

New York, NY

Co-Founder of Toolip

January 2018

- Co-founded Toolip, a sharing economy company facilitating peer-to-peer equipment rentals
- Met with 100+ customers to discover customer interest and continually develop a business model

AEROLIB HEALTHCARE SOLUTIONS LLC

Erie, PA

Biomedical Device Sales Representative

July 2015

- Showcased a medical device prototype to medical device manufacturing companies in France
- Organized licensing discussions between Aerolib and manufacturing companies

HONORS & AWARDS

2019 COLUMBIA BME MOST OUTSTANDING DESIGN PROJECT

May 2019

Award given annually by the Columbia Biomedical Engineering Department to the most outstanding design project from the Senior Design Expo. Award comes with a small grant to continue research and development

2019 FRANK H. AND LORRAINE A. AWARD FOR STUDENT EXCELLENCE

February 2019

Award given annually by the Columbia Engineering Dean Mary C. Boyce for academic achievements and potential

2017 GEORGE WINCHESTER PRIZE IN PHYSICS

April 2017

Award given annually by the Washington & Jefferson College (W&J) Physics Department to one physics major who exhibits intellectual curiosity and scholarly accomplishments

2016 W&J GREEK LIFE NEW MEMBER OF THE YEAR

May 2016

Award given annually to a new member of a fraternity at Washington & Jefferson who exhibits excellence in academics and leadership while contributing to their Greek and college communities

2016 MAPPS APPLIED MATHEMATICS AWARD

April 2016

Award given annually by the Washington & Jefferson Mathematics Department to a distinguished student research project in applied mathematics that relates to the student's career interests

2016 RULES, HUGHES, MURPHY AWARD

February 2016

Most distinguished academic award Washington & Jefferson College presents to five sophomore class members. The President of W&J College chooses annual recipients based on academics, citizenship and leadership

2015 JOSEPHINE S. MARKLEY PRIZE IN PHYSICS

May 2015

Award given annually by the W&J Physics Department to the student currently enrolled in an introductory physics course that receives the highest score on the Josephine Markley Physics Exam

ACTIVITIES / INVOLVEMENT

POLYGENCE RESEARCH MENTORSHIP PROGRAM

High School Scientific Research Mentorship

Online

April 2022 – Present

- Directing mentorship of high school scientific research
- Mentored a project on comparison of surgical & nonsurgical treatment for pediatric Duchenne Muscular Dystrophy

STANFORD MEDICAL STUDENT ASSOCIATION

Advisor: Neil Gesundheit, MD | Stanford School of Medicine

Stanford, CA

August 2021 – Present

- Participating in medical student government as Medical Student Class Representative (M2, M3)
- Organized several medical school-wide events

STANFORD PALS FOR PEDIATRIC CHRONIC ILLNESS

Program Director: William Berquist, MD | Stanford Pediatrics

Stanford, CA

September 2020 – Present

- Paired with a pediatric patient with chronic illness from Lucile Packard Children's Hospital
- Served as a peer mentor in the big brother / big sister program
- Organized coursework as Teaching Assistant 2021-2022 academic year

VARSITY TUTORS

Varsity Tutors Online Tutoring, Classes, & Test Prep

Online

October 2018 – Present

- Certified online and in-person tutor for MCAT, ACT, basic sciences, mathematics, and French
- Mentoring several high school students for classes and college preparation

BARNARD-COLUMBIA CHAMBER CHOIR

Choir Director: Gail Archer, PhD | Barnard Music Dept.

New York, NY

January 2018 – March 2019

- Performed requiems for four semesters featuring works of Bach, Morley, Tchaikovsky, and Stravinsky
- Played the lead role in the 2019 Spring Opera, Eithne, a romantic opera by Robert O'Dwyer

W&J COLLEGE RESIDENT ASSISTANT

Supervisor: Tyler Kowcheck | W&J Residence Life

Washington, PA

September 2015 – May 2017

- Worked two academic years as a freshman dormitory Resident Assistant (RA) at Washington & Jefferson
- Organized community-building and career mentoring events

W&J COLLEGE CHOIR AND CAMERATA SINGERS

Choir Director: Susan Medley, PhD | W&J Music

Washington, PA

September 2014 – May 2017

- Rehearsed six semesters with the college choir and the smaller chamber ensemble
- Performed Brahms's Concerto No. 2 with the Pittsburgh Symphony Orchestra at Heinz Hall
- Sang the National Anthem at the Pirates MLB game at PNC Park (May 23, 2017)

WASHINGTON FELLOWS HONORS PROGRAM

Supervisor: President Tori Haring-Smith, PhD | W&J College

Washington, PA

September 2014 – May 2017

- Attended monthly symposia where we debated issues in bioethics, politics, and education
- Founded TOM Talks—a community TED-styled lecture series event led by the Honors Program
- Delivered keynote speech at the 2016 Accepted Washington Fellows Welcome Dinner
- Served on admissions panels with the college President, Dean of Academic Affairs, and Dean of Enrollment

NCAA DIVISION-III COLLEGE WRESTLING

Head Coach: Tommy Prairie | W&J Athletics

Washington, PA

September 2014 – March 2017

- Competed for three seasons on the W&J varsity team at 149 lb. in open tournaments and dual meets
- Competed in the 2015 NCAA D-III NWCA National Duals Championships, Fort Wayne, IN, January 2015
- Trained with the Paris Olympic Wrestling Club in Summer 2015 under Head Coach Nicolas Rougon