ROBERT D. GREGG IV

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POSITIONS

***Professor*, University of Michigan** 2025 – Present
Robotics
Electrical Engineering and Computer Science
Mechanical Engineering

***Associate Director for Graduate Education*, University of Michigan** 2020 – 2022
Robotics Institute

***Associate Professor*, University of Michigan** 2019 – 2025
Robotics
Electrical Engineering and Computer Science
Mechanical Engineering

***Eugene McDermott Professor*, University of Texas at Dallas** 2018 – 2019

***Assistant Professor*, University of Texas at Dallas** 2013 – 2019
Bioengineering
Mechanical Engineering

***Adjunct Assistant Professor*, UT Southwestern Medical Center** 2014 – 2019
Prosthetics-Orthotics Program

***Research Scientist*, Rehabilitation Institute of Chicago** 2012 – 2013
Center for Bionic Medicine

EDUCATION

***Postdoctoral Fellow*, Rehabilitation Institute of Chicago** 2010 – 2012
Center for Bionic Medicine

***Postdoctoral Fellow*, Northwestern University** 2010 – 2012
Department of Mechanical Engineering

***PhD*, University of Illinois at Urbana-Champaign** Aug 2010
Department of Electrical and Computer Engineering
Dissertation: "Geometric Control and Motion Planning for 3D Bipedal Locomotion"
Advisor: Mark W. Spong, PhD

***MS*, University of Illinois at Urbana-Champaign** Dec 2007
Department of Electrical and Computer Engineering

***BS** (cum laude)*, **University of California – Berkeley** May 2006
Department of Electrical Engineering and Computer Sciences

RESEARCH INTERESTS

Data-Driven Control, Nonlinear Control Theory, Wearable Robots, Prosthetics & Orthotics, Rehabilitation Engineering, Legged Robots, Quasi-Direct Drive Actuators

HONORS AND AWARDS

Personal:
- *IEEE Transactions on Control Systems Technology* Outstanding Paper Award, 2025.
- Faculty Recognition Award, University of Michigan, 2024.
- *IEEE Transactions on Robotics* Best Paper Award Honorable Mention, 2020.
- Moore Inventor Fellows Finalist, Gordon and Betty Moore Foundation, 2020.
- Forchheimer Prize Paper Finalist, International Society for Prosthetics and Orthotics, 2019.
- Provost's Award for Faculty Excellence in Undergrad Research Mentoring, UT Dallas, 2018.
- Eugene McDermott Professorship, University of Texas at Dallas, 2018.
- ICRA Conference Editorial Board Best Associate Editor Award, 2018.
- Bioengineering Undergraduate Teaching Award, University of Texas at Dallas, 2017-18.
- Bioengineering Graduate Student Mentoring Award, University of Texas at Dallas, 2017-18.
- Technology Inventors Award Finalist, Tech Titans, Technology Assoc for North Texas, 2017.
- NSF CAREER Award, Directorate for Engineering, National Science Foundation, 2017.
- Jonsson School Junior Faculty Research Award, University of Texas at Dallas, 2016.
- IEEE Senior Member, Institute of Electrical & Electronics Engineers, 2016.
- Excellence in Biomedical Research Award, Department of Bioengineering, UT Dallas, 2014.
- NIH Director's New Innovator Award, National Institutes of Health, 2013.
- Career Award at the Scientific Interface, Burroughs Wellcome Fund, 2012.
- Best Technical Paper Award, *CLAWAR Conference*, 2011.
- Engineering into Medicine Postdoctoral Fellowship, Northwestern University, 2010.
- O. Hugo Schuck Award (Best Paper), IFAC American Automatic Control Council, 2009.
- Best Student Paper Award, *American Control Conference*, Seattle, WA, 2008.
- Warren Dere Design Award, Department of EECS, UC Berkeley, 2007.
- First Place, NATCAR Intercollegiate Design Contest, UC Davis, 2006.
- Arthur M. Hopkin Award, Department of EECS, UC Berkeley, 2006.
- Christie Senior Research Award, California Alumni Association, UC Berkeley, 2006.

Trainees:
- Victoria Landrum, NETP Training Fellowship, NIH T32 / University of Michigan, 2026.
- Katharine Walters, Towner Prize for Distinguished Academic Achievement, 2026.
- Katharine Walters, Rackham Predoctoral Fellowship, University of Michigan, 2026.
- Ernesto Hernandez Hinojosa, American Heart Association Postdoctoral Fellowship, 2026.
- Nikhil Divekar, Tech Transfer Talent Network (T3N) Postdoc Commercialization Fellowship, 2025.

- Ernesto Hernandez Hinojosa, 3rd Prize Best Poster Award, *Int. Conf. Rehabilitation Robotics*, 2025.
- C. Andrew Seelhoff, NSF Graduate Research Fellowship, 2025.
- Ryan Posh, NIH F32 Ruth L. Kirschstein Postdoctoral Individual Fellowship (F32HD116414), 2025.
- Thomas Kevin Best, Towner Prize for Distinguished Academic Achievement, 2024.
- Shihao Cheng, Best Student Paper Award, *IEEE Int. Conf. Intelligent Robots & Systems (IROS)*, 2023.
- Emily Keller, NSF Graduate Research Fellowship, 2023.
- Shihao Cheng, Rackham Predoctoral Fellowship, University of Michigan, 2023.
- José Montes Perez, NIH Diversity Supplement Award (on R01EB031166), 2022.
- Thomas Kevin Best, NSF Graduate Research Fellowship, 2022.
- Katharine Walters, NSF Graduate Research Fellowship, 2022.
- Daphna Raz, NIH F31 Ruth L. Kirschstein Predoctoral Individual Fellowship (F31EB032745), 2022.
- Roberto Leo Medrano, NIH Diversity Supplement Award (on R01HD094772), 2021.
- Nikhil Divekar, Rackham Predoctoral Fellowship, University of Michigan, 2021.
- Emma Reznick, Best Paper Award Nominee, *IEEE Int. Conf. Biomed. Robot. Biomechatronics,* 2020.
- Nikhil Divekar, Best Student Paper Award Nominee, *IEEE Int. Conf. Biomed. Robot. Biomechatronics,* 2020.
- Emma Reznick, Best Student Poster Award, *Int. Society of Prosthetics & Orthotics (ISPO) Canada, RehabWeek*, 2019.
- Emma Reznick, Best Abstract Award, *Int. Society of Prosthetics & Orthotics (ISPO) Canada, RehabWeek*, 2019.
- David Quintero, David Daniel Thesis Award, Jonsson School of Engineering and Computer Science, UT Dallas, 2019.
- Siavash Rezazadeh, BME Department Staff Research Impact Award, UT Dallas, 2018.
- Chris Nesler, BME Department Staff Undergraduate Research Mentoring Award, UT Dallas, 2018.
- Nikhil Divekar, Jonsson Family Graduate Fellowship in Bioengineering, Jonsson School of Engineering and Computer Science, UT Dallas, 2018.
- Edgar Bolivar, Best Student Robotics Paper Award, *ASME Dyn Sys Control Conf*, 2017.
- Ge Lv, Louis Beecherl Jr. Graduate Fellowship, Jonsson School of Engineering and Computer Science, UT Dallas, 2017-18.
- Saurav Kumar, Best Student Paper Award Finalist, *IEEE Conf Control Tech & App*, 2017.
- Rafi Ayub, NSF Graduate Research Fellowship, National Science Foundation, 2017.
- Ge Lv, Best Student Paper Award, *IEEE Conf Decision & Control*, Osaka, Japan, 2015.
- Dario Villarreal, Jonsson Family Graduate Fellowship in Bioengineering, Jonsson School of Engineering and Computer Science, UT Dallas, 2015.
- David Allen, Excellence in Education Doctoral Fellowship, Jonsson School of Engineering and Computer Science, UT Dallas, 2015.
- Hanqi "Leon" Zhu, Founder's Distinguished Graduate Fellowship, UT Dallas, 2015.
- Kyle Embry, Excellence in Education Doctoral Fellowship, Jonsson School of Engineering and Computer Science, UT Dallas, 2014.
- David Quintero, Excellence in Education Doctoral Fellowship, Jonsson School of Engineering and Computer Science, UT Dallas, 2013.
- Dario Villarreal, Conacyt Graduate Fellowship, CONACYT (Mexico), 2013.

RESEARCH FUNDING

Active:

1. **R. Gregg** (PI), "*Enhancing Voluntary Motion in Broad Patient Populations with Modular Powered Orthoses*," National Institutes of Health/NIBIB (2R01EB031166), 07/01/26–03/31/30, $2,353,545. Percentile: 1%.
2. Stephen Kemp (PI) and **R. Gregg** (Co-I), "*Exoskeleton Control with the Muscle Cuff Regenerative Peripheral Nerve Interface (MC-RPNI) for Restoring Lower Limb Function Following Traumatic Musculoskeletal Injury*," USAMRAA / CDMRP, 07/01/25–06/30/29, $2,477,715.
3. Y. Ding (PI) and **R. Gregg** (Co-PI), "*Hardware and Control Co-Design of Compliant Actuators for Energy-Efficient Humanoid Robots*," National Science Foundation (CMMI-2427036), 01/01/25–12/31/28, $1,215,305.
4. **R. Gregg** (PI), "*Controlling Locomotion over Continuously Varying Activities for Agile Powered Prosthetic Legs*," National Institutes of Health/NICHD (R01HD094772), 12/01/23–11/30/28, $3,067,774. Percentile: 8%.

Completed:

1. **R. Gregg** (PI), "*Enhancing Voluntary Motion in Broad Patient Populations with Modular Powered Orthoses*," National Institutes of Health/NIBIB (R01EB031166), 09/22/21–06/30/26, $1,767,419.
2. **R. Gregg** (PI), "*Continuously-Variable Impedance Control System for Walking Testing on Power Knee*," Össur Inc., 07/03/25–10/02/25, $55,608.
3. **R. Gregg** (PI) and E. Rouse (Co-PI), "*NRI: INT: Collaborative Research: An Open-Source Framework for Continuous Torque Control of Intuitive Robotic Prosthetic Legs*," National Robotics Initiative 2.0, National Science Foundation (CMMI-2024237), 10/01/20–09/30/25, $940,000.
4. **R. Gregg** (PI), "*Understanding Personalized Control with Modular Powered Orthoses*," National Institutes of Health/NIBIB (3R01EB031166-01W1), 09/01/22–08/31/24, $164,560.
5. **R. Gregg** (PI), "*Continuously-Variable Impedance Control System for Walking Testing on Power Knee*," Össur Inc., 05/01/23–04/30/24, $113,478.
6. **R. Gregg** (PI), "*Controlling Robot-Assisted Locomotion with Extended Kalman Filter Estimates of Phase and Activity*," National Institutes of Health/NICHD (3R01HD094772-04S1), 06/01/21–11/30/23, $173,722.
7. **R. Gregg** (PI), "*Controlling Locomotion over Continuously Varying Activities for Agile Powered Prosthetic Legs*," National Institutes of Health/NICHD (R01HD094772), 09/01/18—11/30/2023, $2,227,090. Percentile: 9%.
8. **R. Gregg** (PI), "*CAREER: Recovering and Enhancing Natural Locomotion in Changing Conditions with Powered Lower-Limb Prostheses and Orthoses*," National Science Foundation (CMMI-1652514 → 1949869), 09/01/17–08/31/23, $500,000.
9. **R. Gregg** (UM/Lead PI), S. Rezazadeh (Co-PI), and E. Rouse (UM PI), "*NRI: FND: COLLAB: Optimal Design of Robust Compliant Actuators for Ubiquitous Co-Robots*," National Robotics Initiative 2.0, National Science Foundation (CMMI-1830360 → 1953908), 09/15/18–08/31/22, $750,000 ($431,244 Gregg share).
10. **R. Gregg** (UM PI), H. Geyer (CMU PI), and E. Rouse (UM/Lead PI), "*NRI: FND: COLLAB: An Open-Source Robotic Leg Platform that Lowers the Barrier for Academic Research*," National Robotics Initiative 2.0, National Science Foundation (CMMI-1734600 → 1949346), 10/01/17–09/30/22, $749,054 ($193,000 Gregg share).
11. N. Gans (PI) and **R. Gregg** (Co-PI), "*Time-Invariant, Multi-Objective Extremum Seeking Control for Model-Free Auto-Tuning of Powered Prosthetic Legs*," National Science Foundation (CMMI-1728057 → 2040335), 09/01/17–08/31/22, $373,483.

12. K. Hamed (SDSU PI) and **R. Gregg** (UTD PI), "*NRI: Decentralized Feedback Control Design for Cooperative Robotic Walking with Application to Powered Prosthetic Legs*," National Robotics Initiative, National Science Foundation (CMMI-1637704 → 1854898), 09/01/16–08/31/20, $612,213 ($245,730 Gregg share).
13. **R. Gregg** (PI), "*Phase-Based Control of Locomotion for High-Performance Prostheses and Orthoses*," NIH Director's New Innovator Award, National Institutes of Health/NICHD (DP2HD080349), 09/30/13–06/30/18, $2,295,000. Impact Score: 18.
14. **R. Gregg** (PI), "*From Machine to Biomimetic Control in Robot-Assisted Walking*," Career Award at the Scientific Interface, Burroughs Wellcome Fund, 07/01/12–12/31/20, $500,000.

MANUSCRIPTS UNDER REVIEW

1. L. Duong, R. Posh, S. Cheng, M. Ghaffari, and **R. Gregg**, "A Replay-Constrained Simulation Framework for Personalization of Powered Knee-Ankle Prosthesis Controllers," Under review.
2. J. Montes-Perez, R. Posh, G. Thomas, and **R. Gregg**, "Architecture-independent analysis of task conflicts in data-driven end-to-end controllers for lower-limb wearable robots," Under review.
3. T. K. Best, E. Rouse, and **R. Gregg**, "An Alternative Perspective on Impedance Control in Lower-Limb Prostheses: Decoupling the Feedback and Feedforward Components," Under review.

PEER-REVIEWED JOURNAL ARTICLES

1. J. Zhang, N. Divekar, C. Krishnan, and **R. Gregg**, "Versatile Exoskeleton Control Supports Elderly Joint Energetics During Hip-Intensive Tasks," *IEEE Trans Neural Systems Rehab Eng*, 2026.
2. C. Nestani, **R. Gregg**, and E. Rouse, "Design and Validation of a Parallel Elastic Module for a Quasi-Direct Drive Exoskeleton," *ASME J Mechanisms & Robotics*, 2026.
3. K. Walters, G. Thomas, and **R. Gregg**, "Optimal Energy Shaping and Force Amplification Framework for Task-Agnostic, Biomimetic Ankle Exoskeletons," *IEEE Trans Robotics*, 2026.
4. R. Cortino, S. Cheng, and **R. Gregg**, "Controlling Powered Prosthesis Joint Impedance over Continuous Stance Transitions Between Walking and Stair Ascent/Descent," *IEEE Trans Neural Systems Rehab Eng*, 2026.
5. E. Keller, C. Laubscher, and **R. Gregg**, "Effects of a Powered Knee-Ankle Prosthesis on Intact Joint Biomechanics Across Sustained Activities of Daily Life: A Case Series," *IEEE Trans Neural Systems Rehab Eng*, 2026.
6. N. Divekar, A. Baxter, and **R. Gregg**, "Customizable Task-Agnostic Exoskeleton Control for Targeted Neuromuscular Assistance: Case Series," *IEEE Open J Eng Medicine & Biology*, 2025.
7. T. K. Best, C. A. Seelhoff, J. Wensman, and **R. Gregg**, "The Clinical Effects of the Össur Power Knee with Phase-Based and Default Control During Sitting, Standing, and Walking," *J NeuroEng Rehab*, 2025.
8. E. Reznick, T. K. Best, and **R. Gregg**, "A Clinical Tuning Framework for Continuous Kinematic and Impedance Control of a Powered Knee-Ankle Prosthesis," *IEEE J Translational Eng Health & Medicine*, 2025.
9. S. Cheng, C. Laubscher, T. K. Best, and **R. Gregg**, "Ambilateral Activity Recognition and Continuous Adaptation with a Powered Knee-Ankle Prosthesis," *IEEE Trans Robotics*, 2025.

10. T. K. Best, G. C. Thomas, S. R. Ayyappan, **R. Gregg**, and E. Rouse, "A Compensated Open-Loop Impedance Controller Evaluated on the Second Generation Open-Source Leg Robotic Prosthesis," *IEEE/ASME Trans Mechatronics*, 2024.
11. S. Cheng, C. Laubscher, and **R. Gregg**, "Controlling Powered Prosthesis Kinematics over Continuous Inter-Leg Transitions Between Walking and Stair Ascent/Descent," *IEEE Trans Neural Systems Rehab Eng,* 2024.
12. N. Divekar, G. Thomas, A. Yerva, H. Frame, and **R. Gregg**, "A Versatile Knee Exoskeleton Mitigates Quadriceps Fatigue in Lifting, Lowering, and Carrying Tasks," *Science Robotics*, 2024.
13. J. Lin, N. Divekar, V. Peddinti, G. Thomas, and **R. Gregg**, "A Modular Framework for Task-Agnostic, Energy Shaping Control of Lower-Limb Exoskeletons," *IEEE Trans Control Systems Tech,* 2024. ***TCST* Outstanding Paper Award**.
14. J. Lin, **R. Gregg**, and P. Shull, "Improving Task-Agnostic Energy Shaping Control of Powered Exoskeletons with Task/Gait Classification," *IEEE Robotics & Automation Letters*, 2024.
15. I. Harris, E. Rouse, **R. Gregg**, and G. Thomas, "A Control Framework for Accurate Mechanical Impedance Rendering with Series-Elastic Joints in Prosthetic Applications," *IEEE Robotics & Automation Letters*, 2024.
16. D. Le, S. Cheng, **R. Gregg**, and M. Ghaffari, "Transfer Learning for Efficient Intent Prediction in Lower-Limb Prosthetics: A Strategy for Limited Datasets," *IEEE Robotics & Automation Letters,* 2024.
17. T-W. Hsu, **R. Gregg**, and G. Thomas, "Robustification of Bayesian-Inference-Based Gait Estimation for Lower-limb Wearable Robots," *IEEE Robotics & Automation Letters*, 2024.
18. S. Cheng, C. Laubscher, and **R. Gregg**, "Automatic Stub Avoidance for a Powered Prosthetic Leg on Stairs and Obstacles," *IEEE Trans Biomedical Eng.,* 2023.
19. R. Cortino, T. K. Best, and **R. Gregg**, "Data-Driven Phase-Based Control of a Powered Knee-Ankle Prosthesis for Variable-Incline Stair Ascent and Descent," *IEEE Trans Medical Robotics & Bionics*, 2023.
20. C. Welker, T. K. Best, **R. Gregg**, "Improving Sit/Stand Loading Symmetry and Timing Through Unified Variable Impedance Control of a Powered Knee-Ankle Prosthesis," *IEEE Trans Neural Systems Rehab Eng*, 2023.
21. R. Medrano, G. Thomas, E. Rouse, and **R. Gregg**, "Real-Time Gait Phase and Task Estimation for Controlling Powered Ankle Exoskeletons on Extremely Uneven Terrain," *IEEE Trans Robotics*, 2023.
22. T. K. Best, C. Welker, E. Rouse, and **R. Gregg**, "Data-Driven Variable Impedance Control of a Powered Knee-Ankle Prosthesis for Adaptive Speed and Incline Walking," *IEEE Trans Robotics*, 2023.
23. E. Reznick, C. G. Welker, and **R. D. Gregg**, "Predicting Individualized Joint Kinematics over Continuous Variations of Walking, Running, and Stair Climbing," *IEEE Open J Eng Medicine & Biology*, 2023.
24. S. Cheng, E. Bolivar-Nieto, C. Gonzalez Welker, and **R. Gregg**, "Modeling the Transitional Kinematics Between Variable-Incline Walking and Stair Climbing," *IEEE Trans Medical Robotics & Bionics*, 4(3): 840-851, 2022.
25. R. L. Medrano, G. Thomas, E. Rouse, and **R. Gregg**, "Analysis of the Bayesian Gait-State Estimation Problem for Lower-Limb Exoskeleton Configurations," *IEEE Robotics & Automation Letters*, 2022.
26. S. Kumar, O. Makarenkov, **R. Gregg**, and N. Gans, "Stability of Time-Invariant Extremum Seeking Control for Limit Cycle Minimization," *IEEE Trans Automatic Control*, 2022.
27. J. Lin, N. Divekar, G. Thomas, and **R. Gregg**, "Optimally Biomimetic Passivity-Based Control of a Lower-Limb Exoskeleton over the Primary Activities of Daily Life," *IEEE Open Journal of Control Systems*, 2022. Special Issue on Intersection of Machine Learning with Control.

28. C. Nesler, G. Thomas, N. Divekar, E. Rouse, and **R. Gregg**, "Enhancing Voluntary Motion with Modular, Backdrivable, Powered Hip and Knee Orthoses," *IEEE Robotics & Automation Letters*, 2022.
29. T. Elery, E. Reznick, S. Shearin, K. McCain, **R. Gregg**, "Design and Initial Validation of a Multiple Degree-of-Freedom Joint for an Ankle-Foot Orthosis," *ASME Journal of Medical Devices*, 2022.
30. J. Horn and **R. Gregg**, "Nonholonomic Virtual Constraints for Control of Powered Prostheses Across Walking Speeds," *IEEE Trans Control Systems Tech,* 2021.
31. E. Reznick, K. Embry, R. Neuman, E. Bolivar, N. Fey, and **R. Gregg**, "Lower-Limb Kinematics and Kinetics During Continuously Varying Human Locomotion," *Scientific Data*, 2021.
32. S. Cheng, E. Bolivar, and **R. Gregg**, "Real-Time Activity Recognition with Instantaneous Characteristic Features of Thigh Kinematics," *IEEE Trans Neural Sys Rehab Eng*, 2021.
33. E. Bolivar, T. Summers, **R. Gregg**, and S. Rezazadeh, "A Convex Optimization Framework for Robust-Feasible Series Elastic Actuators," *Mechatronics*, 2021.
34. G. Lv, J. Lin, and **R. Gregg**, "Trajectory-Free Control of Lower-Limb Exoskeletons Through Underactuated Total Energy Shaping," *IEEE Access*, 2021.
35. M. Yeatman and **R. Gregg**, "Using Energy Shaping and Regulation for Limit Cycle Stabilization, Generation, and Transition in Simple Locomotive Systems," *ASME J Computational and Nonlinear Dynamics*, 2021.
36. D. Allen, R. Little, J. Laube, J. Warren, W. Voit, and **R. Gregg**, "Towards an Ankle-Foot Orthosis Powered by a Dielectric Elastomer Actuator," *Mechatronics*, 2021.
37. H. Zhu, C. Nesler, N. Divekar, V. Peddinti, and **R. Gregg**, "Design Principles for Compact, Backdrivable Actuation in Partial-Assist Powered Knee Orthoses," *IEEE/ASME Trans Mechatronics*, 2021.
38. J. Lin, N. Divekar, G. Lv, and **R. Gregg**, "Optimal Task-Invariant Energetic Control for a Knee-Ankle Exoskeleton," *IEEE Control Systems Letters*, 5(5): 1711-1716, 2021.
39. R. Macaluso, K. Embry, D. Villarreal, and **R. Gregg**, "Parameterizing Human Locomotion Across Quasi-Random Treadmill Perturbations and Inclines," *IEEE Trans Neural Sys Rehab Eng*, 29: 508-516, 2021.
40. K. Embry and **R. Gregg**, "Analysis of Continuously Varying Kinematics for Prosthetic Leg Control Applications," *IEEE Trans Neural Sys Rehab Eng*, 29: 262-272, 2021.
41. V. Kamidi, J. Horn, **R. Gregg**, and K. Hamed, "Distributed Controllers for Human-Robot Locomotion: A Scalable Approach Based on Decomposition and Hybrid Zero Dynamics," *IEEE Control Systems Letters*, 2020.
42. T. Elery, S. Rezazadeh, E. Reznick, L. Gray, and **R. Gregg**, "Effects of a Powered Knee-Ankle Prosthesis on Transfemoral Amputee Hip Compensations: A Case Series," *IEEE Trans Neural Sys Rehab Eng,* 28(12): 2944-2954, 2020.
43. S. Kumar, M. Zwall, E. Bolivar, **R. Gregg**, and N. Gans, "Extremum Seeking Control for Stiffness Auto-Tuning of a Quasi-Passive Ankle Exoskeleton," *IEEE Robotics & Automation Letters,* 5(3): 4604-4611, 2020.
44. T. Elery, S. Rezazadeh, C. Nesler, and **R. Gregg**, "Design and Validation of a Powered Knee-Ankle Prosthesis with High-Torque, Low-Impedance Actuators," *IEEE Transactions on Robotics*, 36(6): 1649-1668, 2020. **Best Paper Award Honorable Mention**
45. J. Horn, A. Mohammadi, K. Hamed, and **R. Gregg**, "Nonholonomic Virtual Constraint Design for Variable-Incline Bipedal Robotic Walking," *IEEE Robotics & Automation Letters,* 5(2): 3691-3698, 2020.

46. S. Kumar, A. Mohammadi, D. Quintero, S. Rezazadeh, N. Gans, and **R. Gregg**, "Extremum Seeking Control for Model-Free Auto-Tuning of Powered Prosthetic Legs," *IEEE Trans Control Systems Technology*, 28(6): 2120-2135, 2020.
47. S. Rezazadeh, D. Quintero, N. Divekar, E. Reznick, L. Gray, and **R. Gregg**, "A Phase Variable Approach for Improved Rhythmic and Non-Rhythmic Control of a Powered Knee-Ankle Prosthesis," *IEEE Access*, 7(1): 109840-109855, 2019.
48. K. Hamed, B. Safaee, and **R. Gregg**, "Dynamic Output Controllers for Exponential Stabilization of Periodic Orbits for Multi-Domain Hybrid Models of Robotic Locomotion," *ASME Journal of Dynamic Systems, Measurement, and Control*, 141(12): 121011, 2019.
49. D. Allen, E. Bolivar, S. Farmer, W. Voit, and **R. Gregg**, "Mechanical Simplification of Variable Stiffness Actuators Using Dielectric Elastomer Transducers," *Actuators*, 8(2): 1-19, 2019. Special Issue on New Materials and Designs for Soft Actuators.
50. M. Yeatman, G. Lv, and **R. Gregg**, "Decentralized Passivity-Based Control with a Generalized Energy Storage Function for Robust Biped Locomotion," *ASME Journal of Dynamic Systems, Measurement, and Control*, 141(10): 101007, 2019.
51. E. Bolivar, S. Rezazadeh, and **R. Gregg**, "Minimizing Energy Consumption and Peak Power of Series Elastic Actuators: A Convex Optimization Framework for Elastic Element Design," *IEEE/ASME Transactions on Mechatronics*, 24(3):1334-1345, 2019.
52. A. Mohammadi and **R. Gregg**, "Variable Impedance Control of Powered Knee Prostheses Using Human-Inspired Algebraic Curves," *ASME Journal of Computational and Nonlinear Dynamics*, 14(10): 101007, 2019. Special Issue on Nonlinear and Computational Dynamics in Biomedical Applications.
53. J. Horn, A. Mohammadi, K. Hamed, and **R. Gregg**, "Hybrid Zero Dynamics of Bipedal Robots Under Nonholonomic Virtual Constraints," *IEEE Control Systems Letters,* 3(2): 386-391, 2019.
54. K. Hamed and **R. Gregg**, "Decentralized Event-Based Controllers for Robust Stabilization of Hybrid Periodic Orbits: Application to Underactuated 3D Bipedal Walking," *IEEE Trans Automatic Control*, 64(6): 2266-2281, 2019.
55. K. Embry, D. Villarreal, R. Macaluso, and **R. Gregg**, "Modeling the Kinematics of Human Locomotion over Continuously Varying Speeds and Inclines," *IEEE Trans Neural Sys Rehab Eng,* 26(12): 2342-2350, 2018.
56. D. Quintero, E. Reznick, D. Lambert, S. Rezazadeh, L. Gray, and **R. Gregg**, "Intuitive Clinician Control Interface for a Powered Knee-Ankle Prosthesis: A Case Study," *IEEE Journal of Translational Engineering in Health and Medicine*, 6(1): 1-9, 2018.
57. G. Lv, H. Zhu, and **R. Gregg**, "On the Design and Control of Highly Backdrivable Lower-limb Exoskeletons," *IEEE Control Systems Magazine*, 38(6): 88-113, 2018.
58. D. Quintero, D. Villarreal, D. Lambert, S. Kapp, and **R. Gregg**, "Continuous-Phase Control of a Powered Knee-Ankle Prosthesis: Amputee Experiments Across Speeds and Inclines," *IEEE Trans Robotics*, 34(3): 686-701, 2018.
59. G. Lv and **R. Gregg**, "Underactuated Potential Energy Shaping with Contact Constraints: Application to a Powered Knee-Ankle Orthosis," *IEEE Trans Contr Sys Tech*, 26(1): 181-193, 2018.
60. D. Quintero, A. Martin, and **R. Gregg**, "Toward Unified Control of a Powered Prosthetic Leg: A Simulation Study," *IEEE Trans Control Systems Technology*, 26(1): 305-312, 2018.
61. A. Martin and **R. Gregg**, "Stable, Robust Hybrid Zero Dynamics Control of Powered Lower-Limb Prostheses," *IEEE Trans Automatic Control*, 62(8): 3930-3942, 2017.

62. K. Hamed and **R. Gregg**, "Decentralized Feedback Controllers for Robust Stabilization of Periodic Orbits of Hybrid Systems: Application to Bipedal Walking," *IEEE Trans Control Systems Technology*, 25(4): 1153-1167, 2017.
63. D. Villarreal, H. Poonawala, and **R. Gregg**, "A Robust Parameterization of Human Gait Patterns Across Phase-Shifting Perturbations," *IEEE Trans Neural Sys Rehab Eng*, 25(3): 265-278, 2017.
64. R. Ayub, D. Villarreal, **R. Gregg**, and F. Gao, "Evaluation of Transradial Body-Powered Prostheses Using a Robotic Simulator," *Prosthetics Orthotics Int*, 41(2): 194-200, 2017.
65. A. Plauché, D. Villarreal, and **R. Gregg**, "A Haptic Feedback System for Phase-Based Sensory Restoration in Above-Knee Prosthetic Leg Users," *IEEE Trans Haptics*, 9(3): 421-426, 2016.
66. D. Villarreal, D. Quintero, and **R. Gregg**, "A Perturbation Mechanism for Investigations of Phase-Dependent Behavior in Human Locomotion," *IEEE Access*, 4: 893-904, 2016.
67. A. Martin and **R. Gregg**, "Incorporating Human-like Walking Variability in an HZD-Based Bipedal Model," *IEEE Trans Robotics*, 32(4): 943-948, 2016. Special Issue on Movement Science for Humans and Humanoids: Methods and Applications.
68. A. Martin, D. Villarreal, and **R. Gregg**, "Characterizing and Modeling the Joint-level Variability in Human Walking," *J Biomechanics*, 49(14): 3298-3305, 2016.
69. **R. Gregg**, T. Lenzi, L. Hargrove, and J. Sensinger, "Virtual Constraint Control of a Powered Prosthetic Leg: From Simulation to Experiments with Transfemoral Amputees," *IEEE Trans Robotics*, 30(6): 1455-1471, 2014.
70. **R. Gregg**, E. Rouse, L. Hargrove, and J. Sensinger, "Evidence for a Time-Invariant Phase Variable in Human Ankle Control," *PLoS ONE*, 9(2): e89163, 2014.
71. **R. Gregg** and J. Sensinger, "Towards Biomimetic Virtual Constraint Control of a Powered Prosthetic Leg," *IEEE Trans Control Systems Technology*, 22(1): 246-254, 2014.
72. A. Degani, A. Long, S. Feng, B. Brown, **R. Gregg**, H. Choset, M. Mason, and K. Lynch, "Design and Open-Loop Control of the ParkourBot, a Dynamic Climbing Robot," *IEEE Trans Robotics*, 30(3): 705-718, 2014.
73. **R. Gregg** and L. Righetti, "Controlled Reduction with Unactuated Cyclic Variables: Application to 3D Bipedal Walking with Passive Yaw Rotation," *IEEE Trans Automatic Control*, 58(10): 2679-2685, 2013.
74. E. Rouse, **R. Gregg,** L. Hargrove, and J. Sensinger, "The Difference Between Mechanical Stiffness and Quasi-Stiffness in the Context of Biomechanical Modeling," *IEEE Trans Biomed Eng*, 60(2): 562-568, 2013.
75. **R. Gregg**, Y. Dhaher, A. Degani, and K. Lynch, "On the Mechanics of Functional Asymmetry in Bipedal Walking," *IEEE Trans Biomed Eng*, 59(5): 1310-1318, 2012.
76. **R. Gregg**, A. Tilton, S. Candido, T. Bretl, and M. Spong, "Control and Planning of 3D Dynamic Walking with Asymptotically Stable Gait Primitives," *IEEE Trans Robotics*, 28(6): 1415-1423, 2012.
77. **R. Gregg** and M. Spong, "Reduction-Based Control of Three-Dimensional Bipedal Walking Robots," *Int J Robotics Research*, 29(6): 680-702, 2010.

PEER-REVIEWED CONFERENCE PROCEEDINGS

1. A. Lang, C. Laubscher, S. Cheng, and **R. Gregg**, "Vibrotactile Haptic and Gesture Feedback in a Smartwatch for Controlling a Multi-Activity Powered Knee-Ankle Prosthesis," in *IEEE Int Conf Eng Medicine & Biology (EMBC)*, 2025.

2. K. Walters, E. Hernandez Hinojosa, and **R. Gregg**, "Task-Agnostic Exoskeleton Torque Assistance Reduces Ankle Osteoarthritis Pain: A Pilot Study," in *IEEE Int Conf Eng Medicine & Biology (EMBC)*, 2025.
3. T. K. Best, C. A. Seelhoff, and **R. Gregg**, "Implementation and Validation of a Data-Driven Variable Impedance Controller on the Össur Power Knee," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
4. C. A. Seelhoff, T. K. Best, and **R. Gregg**, "Adapting Biomimetic Kinematics for Controlling a Powered-Knee, Passive-Ankle Prosthesis Across Inclines," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
5. R. Posh and **R. Gregg**, "A Task-Agnostic Approach to Unified Multi-Activity Gait Phase Estimation via Bilateral Sensing," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
6. J. Zhang, N. Divekar, E. Hernandez Hinojosa, and **R. Gregg**, "A Task-Agnostic Hip Exoskeleton for Osteoarthritis Pain Relief: Energetic Control Across Activities of Daily Life," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
7. N. Divekar, E. Hernandez Hinojosa, and **R. Gregg**, "A Task-Agnostic Knee Exoskeleton for Reducing Osteoarthritis Pain Across Activities of Daily Life: A Pilot Study," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
8. Y. Wang, J. Montes-Perez, **R. Gregg**, and G. Thomas, "Human-Interface Dynamics of Knee Exoskeletons with Lateral and Anteroposterior Attachment," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
9. K. Waters, B. Zou, T. K. Best, **R. Gregg**, and C. Welker, "Investigating kinematic and kinetic asymmetries during sit/stand movements with a powered knee-ankle prosthesis: a pilot study," in *IEEE Int Conf Rehab Robotics (ICORR)*, 2025.
10. S. Zhao, K. Walters, J. Montes-Perez, and **R. Gregg**, "Design and Validation of a Modular, Backdrivable Ankle Exoskeleton," in *IEEE Int Conf Biomedical Robotics & Biomechatronics (BioRob)*, 2024.
11. A. Lee, C. Laubscher, T. K. Best, and **R. Gregg**, "Towards a Unified Approach for Continuously-Variable Impedance Control of Powered Prosthetic Legs over Walking Speeds and Inclines," in *IEEE Int Conf Robotics & Automation (ICRA)*, 2024.
12. S. Cheng, C. Laubscher, and **R. Gregg**, "Controlling Powered Prosthesis Kinematics over Continuous Transitions Between Walk and Stair Ascent," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2023. **Best Student Paper Award**
13. T. K. Best, C. Laubscher, R. Cortino, S. Cheng, and **R. Gregg**, "Improving Amputee Endurance over Activities of Daily Living with a Robotic Knee-Ankle Prosthesis: A Case Study," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2023. **Best Application Paper Award Finalist**
14. K. Walters, G. Thomas, J. Lin, and **R. Gregg**, "An Energetic Approach to Task-Invariant Ankle Exoskeleton Control," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2023.
15. J. Montes-Perez, G. Thomas, and **R. Gregg**, "Effects of Personalization on Gait-State Tracking Performance Using Extended Kalman Filters," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2023.
16. J. Zhang, J. Lin, V. Peddinti, and **R. Gregg**, "Optimal Energy Shaping Control for a Backdrivable Hip Exoskeleton," in *American Control Conf*, 2023.
17. E. Keller, C. Laubscher, and **R. Gregg**, "Gait Event Detection with Proprioceptive Force Sensing in a Powered Knee-Ankle Prosthesis: Validation over Walking Speeds and Slopes," in *IEEE Int Conf Robotics & Automation (ICRA)*, 2023.

18. C. Welker, T. K. Best, and **R. Gregg**, "Data-Driven Variable Impedance Control of a Robotic Knee-Ankle Prosthesis for Sit, Stand, and Walk with Minimal Tuning," *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2022.
19. R. Cortino, E. Bolivar, T. K. Best, and **R. Gregg**, "Stair Ascent Phase-Variable Control of a Powered Knee-Ankle Prosthesis," in *IEEE Int Conf Robotics & Automation (ICRA)*, 2022.
20. S. Guo, **R. Gregg**, and E. Bolivar, "Convex Optimization for Spring Design of Parallel Elastic Actuators," in *American Control Conf*, 2022.
21. G. Thomas and **R. Gregg**, "An Energy Shaping Exoskeleton Controller for Human Strength Amplification," in *IEEE Conf Decision & Control*, 2021.
22. P. Kannapan, D. Garmire, and **R. Gregg**, "EMMA: Earthworm Mimetic Manipulator Architecture for Access-Constrained Environments," in *Int Conf Advanced Robotics*, 2021.
23. E. Bolivar, G. Thomas, E. Rouse, and **R. Gregg**, "Convex Optimization for Spring Design in Series Elastic Actuators: From Theory to Practice," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2021.
24. T. K. Best, K. Embry, E. Rouse, and **R. Gregg**, "Phase-Variable Control of a Powered Knee-Ankle Prosthesis over Continuously Varying Speeds and Inclines," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2021.
25. D. Raz, E. Bolivar, N. Ozay, and **R. Gregg**, "Toward Phase-Variable Control of Sit-to-Stand Motion with a Powered Knee-Ankle Prosthesis," in *IEEE Conf on Control Tech & Applications*, 2021.
26. N. Divekar, J. Lin, C. Nesler, and **R. Gregg**, "A Potential Energy Shaping Controller with Ground Reaction Force Feedback for a Multi-Activity Knee-Ankle Exoskeleton," in *IEEE Int. Conf. Biomedical Robotics Biomechatronics*, 2020.
27. E. Reznick, K. Embry, and **R. Gregg**, "Predicting Individualized Joint Kinematics over a Continuous Range of Slopes and Speeds," in *IEEE Int. Conf. Biomedical Robotics Biomechatronics*, 2020.
28. G. Lv, H. Xing, J. Lin, **R. Gregg**, and C. Atkeson, "A Task-Invariant Learning Framework of Lower-Limb Exoskeletons for Assisting Human Locomotion," in *American Control Conf.*, 2020.
29. J. Lin, N. Divekar, G. Lv, and **R. Gregg**, "Energy Shaping Control with Virtual Spring and Damper for Powered Exoskeletons," in *IEEE Conf on Decision & Control*, 2019.
30. H. Zhu, C. Nesler, N. Divekar, M. Ahmad, and **R. Gregg**, "Design and Validation of a Partial-Assist Knee Orthosis with Compact, Backdrivable Actuation," in *IEEE Int Conf on Rehab Robotics*, pp. 917-924, 2019.
31. E. Bolivar, S. Rezazadeh, T. Summers, and **R. Gregg**, "Robust Optimal Design of Series Elastic Actuators: Application to a Powered Prosthetic Ankle," in *IEEE Int Conf on Rehab Robotics*, pp. 740-747, 2019.
32. J. Lin, G. Lv, and **R. Gregg**, "Contact-Invariant Total Energy Shaping for Powered Exoskeletons," in *American Control Conference*, 2019.
33. S. Kumar, A. Mohammadi, **R. Gregg**, and N. Gans, "Limit Cycle Minimization by Time-Invariant Extremum Seeking Control," in *American Control Conference*, 2019.
34. A. Mohammadi, S. Fakoorian, J. Horn, D. Simon, and **R. Gregg**, "Hybrid Nonlinear Disturbance Observer Design for Underactuated Bipedal Robots," in *IEEE Conf. Decision & Control*, 2018.
35. S. Rezazadeh, D. Quintero, N. Divekar, and **R. Gregg**, "A Phase Variable Approach to Volitional Control of Powered Knee-Ankle Prostheses," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Spain, 2018. (46.7% acceptance rate)
36. A. Mohammadi and **R. Gregg**, "Human-Inspired Algebraic Curves for Wearable Robot Control," in *ASME Dynamic Systems & Control Conference*, 2018.

37. T. Elery, S. Rezazadeh, C. Nesler, J. Doan, H. Zhu, and **R. Gregg**, "Design and Benchtop Validation of a Powered Knee-Ankle Prosthesis with High-Torque, Low-Impedance Actuators," in *IEEE Int Conf Robotics & Automation (ICRA)*, Brisbane, Australia, pp. 2788-2795, 2018. (41% acceptance rate)
38. M. Yeatman, G. Lv, and **R. Gregg**, "Passivity-Based Control with a Generalized Energy Storage Function for Robust Bipedal Walking," in *American Control Conference*, Milwaukee, WI, 2018.
39. K. Hamed, **R. Gregg**, and A. Ames, "Exponentially Stabilizing Controllers for Multi-Contact 3D Bipedal Locomotion," in *American Control Conference*, Milwaukee, WI, 2018.
40. K. Hamed, A. Ames, and **R. Gregg**, "Observer-Based Feedback Controllers for Exponential Stabilization of Hybrid Periodic Orbits: Application to Underactuated Bipedal Walking," in *American Control Conference*, Milwaukee, WI, 2018.
41. D. Allen, S. Farmer, **R. Gregg**, and W. Voit, "Stretchable conductive fabric simplifies manufacturing of low-resistance dielectric-elastomer-system electrodes," *SPIE Electroactive Polymer Actuators and Devices*, 2018.
42. E. Bolivar, S. Rezazadeh, and **R. Gregg**, "A General Framework for Minimizing Energy Consumption of Series Elastic Actuators with Regeneration," in *ASME Dynamic Systems & Control Conf*, Virginia, pp. V001T36A005, 2017. **Best Student Robotics Paper Award**
43. A. Mohammadi, J. Horn, and **R. Gregg**, "Removing Phase Variables from Biped Robot Parametric Gaits," in *IEEE Conf on Control Tech & Applications* (Invited Session on Robotic Locomotion Control), Hawaii, pp. 834-840, 2017.
44. S. Kumar, A. Mohammadi, N. Gans, and **R. Gregg**, "Automatic Tuning of Virtual Constraint-Based Control Algorithms for Powered Knee-Ankle Prostheses," in *IEEE Conf on Control Tech & Applications* (Invited Session on Robotic Locomotion Control), Hawaii, pp. 812-818, 2017. **Best Student Paper Award Finalist**.
45. D. Quintero, D. Lambert, D. Villarreal, and **R. Gregg**, "Real-Time Continuous Gait Phase and Speed Estimation from a Single Sensor," in *IEEE Conf on Control Tech & Applications* (Invited Session on Robotic Locomotion Control), Hawaii, pp. 847-852, 2017.
46. D. Villarreal, D. Quintero, and **R. Gregg**, "Piecewise and Unified Phase Variables in the Control of a Powered Prosthetic Leg," in *IEEE Int Conf Rehab Robotics*, London, pp. 1425-1430, 2017.
47. G. Lv and **R. Gregg**, "Towards Total Energy Shaping Control of Lower-Limb Exoskeletons," in *American Control Conference*, Seattle, WA, pp. 4851-4857, 2017.
48. H. Zhu, J. Doan, C. Stence, G. Lv, T. Elery, and **R. Gregg**, "Design and Validation of a Torque Dense, Highly Backdrivable Powered Knee-Ankle Orthosis," in *IEEE Int Conf Robotics & Automation (ICRA)*, Singapore, pp. 504-510, 2017. (41% acceptance rate)
49. S. Rezazadeh and **R. Gregg**, "A Control Framework for Anthropomorphic Biped Walking Based on Stabilizing Feedforward Trajectories," in *ASME Dynamic Systems & Control Conference*, Minneapolis, MN, pp. V001T06A007, 2016.
50. E. Bolivar, D. Allen, G. Ellson, J. Cossio, W. Voit, and **R. Gregg**, "Towards a Series Elastic Actuator with Electrically Modulated Stiffness for Powered Ankle-Foot Orthoses," in *IEEE Conf Automation Science & Engineering*, Fort Worth, TX, pp. 1086-1093, 2016.
51. D. Quintero, D. Villarreal, and **R. Gregg**, "Preliminary Experiments with a Unified Controller for a Powered Knee-Ankle Prosthetic Leg Across Walking Speeds," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Daejeon, Korea, pp. 5427-5433, 2016. (48% acceptance rate)
52. K. Embry, D. Villarreal, and **R. Gregg**, "A Unified Parameterization of Human Gait Across Ambulation Modes," in *IEEE Eng Medicine Biology Conf*, Orlando, FL, pp. 2179-2183, 2016.

53. D. Villarreal and **R. Gregg**, "Unified Phase Variables of Relative Degree Two for Human Locomotion," in *IEEE Eng Medicine Biology Conf*, Orlando, FL, pp. 6262-6267, 2016.
54. **R. Gregg** and A. Martin, "Prosthetic Leg Control in the Nullspace of Human Interaction," in *American Control Conf* (Invited Session on Control Theory in Legged Locomotion), Boston, MA, pp. 4814-4821, 2016.
55. K. Hamed and **R. Gregg**, "Decentralized Feedback Controllers for Exponential Stabilization of Hybrid Periodic Orbits: Application to Robotic Walking," in *American Control Conf* (Invited Session on Control Theory in Legged Locomotion), Boston, MA, pp. 4793-4800, 2016.
56. G. Lv, H. Zhu, T. Elery, L. Li, and **R. Gregg**, "Experimental Implementation of Underactuated Potential Energy Shaping on a Powered Ankle-Foot Orthosis," in *IEEE Int Conf Robotics & Automation (ICRA)*, Stockholm, Sweden, pp. 3493-3500, 2016. (34.7% acceptance rate)
57. D. Villarreal, D. Quintero, and **R. Gregg**, "A Perturbation Mechanism for Investigations of Phase Variables in Human Locomotion," in *IEEE Int Conf Robotics & Biomimetics*, Zhuhai, China, pp. 2065-2071, 2015.
58. G. Lv and **R. Gregg**, "Orthotic Body-Weight Support Through Underactuated Potential Energy Shaping with Contact Constraints," in *IEEE Conf Decision and Control*, Osaka, Japan, pp. 1483-1490, 2015. **Best Student Paper Award**
59. D. Quintero, A. Martin, and **R. Gregg**, "Unifying the Gait Cycle in the Control of a Powered Prosthetic Leg," in *IEEE Int Conf Rehabilitation Robotics*, Singapore, pp. 289-294, 2015.
60. A. Martin and **R. Gregg**, "Hybrid Invariance and Stability of a Feedback Linearizing Controller for Powered Prostheses," in *Amer Control Conf*, pp. 4670-4676, 2015.
61. A. Nanjangud and **R. Gregg**, "Simultaneous Control of Virtual Constraints for Ankle-Foot Prostheses," in *ASME Dynamic Systems & Control Conf* (Invited Session on Physical Human-Robot Interactions), San Antonio, TX, pp. V001T04A001, 2014.
62. D. Villarreal and **R. Gregg**, "A Survey of Phase Variable Candidates of Human Locomotion," in *IEEE Eng Medicine & Biology Conf*, Chicago, IL, pp. 4017-4021, 2014.
63. A. Nanjangud and **R. Gregg**, "Simultaneous Control of the Compass-Gait Biped for Maintaining Symmetric Gait Across All Mass Ratios," in *American Control Conf*, Portland, OR, pp. 5490-5495, 2014.
64. **R. Gregg**, T. Lenzi, N. Fey, L. Hargrove, and J. Sensinger, "Experimental Effective Shape Control of a Powered Transfemoral Prosthesis," in *IEEE Int Conf Rehabilitation Robotics*, Seattle, WA, 2013.
65. **R. Gregg** and J. Sensinger, "Biomimetic Virtual Constraint Control of a Transfemoral Powered Prosthetic Leg," in *American Control Conf*, Washington, DC, pp. 5702-5708, 2013.
66. **R. Gregg** and U. Topcu, "Towards Formal Verification Methods for Robotic Lower-Limb Prostheses and Orthoses," in the Medical Cyber Physical Systems Workshop, *CPS Week*, Philadelphia, PA, 2013.
67. N. Rosa, A. Barber, **R. Gregg**, K. Lynch, "Stable Open-Loop Brachiation on a Vertical Wall," in *IEEE Int Conf Robotics & Automation (ICRA)*, St. Paul, MN, pp. 1193-1199, 2012.
68. **R. Gregg**, Y. Dhaher, and K. Lynch, "Functional Asymmetry in a Five-Link 3D Bipedal Walker," in *IEEE Eng Med & Bio Conf*, Boston, MA, pp. 7820-7823, 2011.
69. **R. Gregg**, "Controlled Reduction of a Five-Link 3D Biped with Unactuated Yaw," in *IEEE Conf Decision & Control*, Orlando, FL, pp. 669–674, 2011.
70. A. Long, **R. Gregg**, and K. Lynch, "The Simplest Parkour Model: Experimental Validation and Stability Analysis," in *Int Conf Climbing & Walking Robots*, Paris, France, 2011. **Best Technical Paper Award**

71. **R. Gregg**, A. Degani, Y. Dhaher, and K. Lynch, "The Basic Mechanics of Bipedal Walking Lead to Asymmetric Behavior," in *IEEE Int Conf Rehab Robotics*, Zurich, Switzerland, 2011.
72. **R. Gregg**, T. Bretl, and M. Spong, "A Control Theoretic Approach to Robot-Assisted Locomotor Therapy," in *IEEE Conf Decision & Control*, Atlanta, GA, pp. 1679-1686, 2010.
73. **R. Gregg**, L. Righetti, J. Buchli, and S. Schaal, "Constrained Accelerations for Controlled Geometric Reduction: Sagittal-plane Decoupling for Bipedal Locomotion," in *IEEE Int Conf Humanoid Robots*, Nashville, TN, 2010.
74. **R. Gregg**, T. Bretl, and M. Spong, "Asymptotically Stable Gait Primitives for Planning Dynamic Bipedal Locomotion in Three Dimensions," in *IEEE Int Conf Robotics & Automation (ICRA)*, Anchorage, AK, pp. 1695–1702, 2010.
75. **R. Gregg** and M. Spong, "Bringing the Compass-Gait Bipedal Walker to Three Dimensions," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, St. Louis, MO, pp. 4469–4474, 2009.
76. **R. Gregg** and M. Spong, "Reduction-Based Control of Branched Chains: Application to Three-Dimensional Bipedal Torso Robots," in *IEEE Conf Decision & Control*, Shanghai, China, pp. 8166–8173, 2009.
77. **R. Gregg** and M. Spong, "Reduction-Based Control with Application to 3D Bipedal Walking Robots," in *Amer Control Conf*, Seattle, WA, pp. 880–887, 2008. **Best Student Paper Award** and **O Hugo Schuck Award**
78. A. Ames, **R. Gregg**, and M. Spong, "A Geometric Approach to Three-Dimensional Hipped Bipedal Robotic Walking," in *IEEE Conf Decision & Control*, New Orleans, LA, pp. 5123–5130, 2007.
79. A. Ames and **R. Gregg**, "Stably Extending Two-Dimensional Bipedal Walking to Three Dimensions," in *American Control Conf*, New York, NY, pp. 2848-2854, 2007.
80. A. Ames, **R. Gregg**, E. Wendel, and S. Sastry, "Towards the Geometric Reduction of Controlled Three-Dimensional Bipedal Robotic Walkers," in *Workshop on Lagrangian & Hamiltonian Methods for Nonlinear Control*, Nagoya, Japan, 2006.
81. A. Ames, H. Zheng, **R. Gregg**, and S. Sastry, "Is there Life after Zeno? Taking Executions past the Breaking (Zeno) Point," in *American Control Conf*, Minneapolis, MN, 2006.

CONFERENCE ABSTRACTS

1. C. Laubscher, T. K. Best, R. Cortino, S. Cheng, and **R. Gregg**, "Multi-Activity Endurance of Transfemoral Amputee Users with a Powered Knee-Ankle Prosthesis," *Dynamic Walking Conf*, 2023.
2. T. K. Best, C. Welker, E. Rouse, and **R. Gregg**, "A Convex Optimization Approach for Phase Variable Impedance Control of Knee-Ankle Prostheses," *Dynamic Walking Conference*, 2022.
3. **R. Gregg**, "Controlling Locomotion over Continuously Varying Activities for Agile Powered Prosthetic Legs," *Dynamic Walking Conference*, 2022.
4. J. Lin, N. Divekar, and **R. Gregg**, "Task-Invariant Control of Backdrivable Knee Exoskeletons for Partial Assistance," *Dynamic Walking Conference*, 2022.
5. T. K. Best, E. Rouse, and **R. Gregg**, "Continuous Phase-Varying Impedance Control of a Knee-Ankle Prosthesis for Incline Walking," *Dynamic Walking Conference*, 2021.
6. S. Cheng, E. Bolivar, and **R. Gregg**, "Real-Time Lower-Limb Activity Recognition with Instantaneous Characteristic Features of Thigh Kinematics," *Dynamic Walking Conference*, 2021.
7. R. Cortino, E. Bolivar, and **R. Gregg**, "Towards Phase-Variable Control of Stair Ascent of Powered Knee-Ankle Prostheses," *Dynamic Walking Conference*, 2021.

8. J. Perez, G. Thomas, and **R. Gregg**, "Low-Dimensional Individualized Continuous-Task Joint Kinematic Modelling," *Dynamic Walking Conference*, 2021.
9. E. Reznick and **R. Gregg**, "Investigating Gait Individuality Across Ambulation Modes," *Dynamic Walking Conference*, 2021.
10. E. Bolivar, K. Embry, T. Elery, E. Reznick, and **R. Gregg**, "Powered knee-ankle prostheses for community ambulation: controlling locomotion over continuously varying activities," *NIH Rehabilitation Research 2020: Envisioning a Functional Future Conference*, 2020.
11. G. Thomas, J. Lin, N. Divekar, C. Nesler, and **R. Gregg**, "Task-Invariant Assistance using Backdrivable, Powered Orthoses," *Rehabilitation Research 2020: Envisioning a Functional Future Conference*, 2020.
12. S. Kumar, O. Makarenkov, **R. Gregg**, and N. Gans, "Time-Invariant Extremum Seeking Control," in *American Control Conference*, 2020.
13. M. Yeatman, S. Rezazadeh, and **R. Gregg**, "Energy Shaping and Tracking for Natural Limit Cycles in Hybrid Systems," *Dynamic Walking Conference*, 2020.
14. N. Divekar and **R. Gregg**, "Design and Validation of a Backdrivable Powered Knee Orthosis for Partial Assistance of Lower Limb Musculature," *Dynamic Walking Conference*, 2020.
15. R. Neuman, K. Embry, E. Reznick, **R. Gregg**, and N. Fey, "Stair Inclination Angle Significantly Affects Walking Kinematics Over Specific Regions of Gait Cycle During Ascending and Descending Tasks," *Biomedical Engineering Society*, 2019.
16. N. Divekar, C. Nesler, and **R. Gregg**, "Feasibility of a task-invariant control scheme for a knee-ankle exoskeleton designed for stroke rehabilitation," *International Society of Prosthetics & Orthotics (ISPO) Canada/RehabWeek*, 2019.
17. E. Reznick and **R. Gregg**, "Intuitive Clinician Control Interface for a Powered Knee-Ankle Prosthesis: A Case Study," *International Society of Prosthetics & Orthotics (ISPO) Canada/RehabWeek*, 2019.
18. **R. Gregg**, "Phase-based control of locomotion for high-performance prostheses and orthoses," in *NIH Director's High-Risk High-Reward Research Symp*, Bethesda, MD, 2018.
19. **R. Gregg**, "Continuously parameterizing the timing and task adaptations of human locomotion for the control of powered prosthetic legs," in *World Congress Biomech*, 2018.
20. S. Rezazadeh and **R. Gregg**, "Using holonomic and nonholonomic parameterizations to control powered multi-joint prosthetic legs," in *Dynamic Walking Conf*, 2018.
21. S. Kumar, A. Mohammadi, N. Gans, and **R. Gregg**, "Extremum seeking control for model-free auto-tuning of powered prosthetic legs," in *IEEE Int Conf Robotics & Automation (ICRA)*, 2018.
22. S. Rezazadeh and **R. Gregg**, "Towards a robust control paradigm for steady-state and transient walking with active transfemoral prostheses," in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2017.
23. E. Bolivar, S. Rezazadeh, and **R. Gregg**, "How much energy can really be saved using series elastic actuators?", in *IEEE Int Conf Intelligent Robots & Systems (IROS)*, 2017.
24. S. Rezazadeh and **R. Gregg**, "A constructive framework for control of anthropomorphic biped systems," in *Dynamic Walking Conf*, 2016.
25. A. Martin, D. Villarreal, and **R. Gregg**, "Adding variability to a moderately-complex human walking model," in *Dynamic Walking Conf*, 2016.
26. A. Martin, D. Villarreal, K. Embry, **R. Gregg**, "Relationship between socket forces and center of pressure location for transfemoral amputees," in *American Society of Biomech*, 2016.

27. **R. Gregg**, "High-performance control of powered prosthetic legs with human-inspired phase variables," in *NIH Director's High-Risk High-Reward Research Symp*, Bethesda, MD, 2015.
28. D. Quintero, A. Martin, and **R. Gregg**, "Giving up the finite state machine in the control of lower-limb wearable robots?", in Workshop on Rehabilitation Robotics and Human-Robot Interaction, *IEEE Int Conf Robotics & Automation (ICRA)*, Seattle, WA 2015.
29. **R. Gregg**, "Virtual constraint control of a powered prosthetic leg: experiments with transfemoral amputees," in Dynamic Locomotion Workshop, *Robotics: Science & Systems*, Berkeley, CA, 2014.
30. D. Villarreal and **R. Gregg**, "Phase-based control of locomotion for high-performance prostheses and orthoses," in *Neural Interfaces Conf*, Dallas, TX, 2014.
31. **R. Gregg**, "Phase-based control of locomotion for high-performance prostheses and orthoses," in *NIH Director's High-Risk High-Reward Research Symp*, Bethesda, MD, 2013.
32. **R. Gregg**, E. Rouse, L. Hargrove, and J. Sensinger, "The hypothesis of feedback pattern generation in human locomotion," in *Dynamic Walking Conf,* Pittsburgh, PA, June 2013.
33. **R. Gregg** and J. Sensinger, "From machine to biomimetic control of powered prosthetic legs," in *Dynamic Walking Conf*, Pensacola, FL, May 2012.

BOOK CHAPTERS

1. D. Villarreal and **R. Gregg**, "Controlling a Powered Transfemoral Prosthetic Leg Using a Unified Phase Variable," in *Wearable Robots: Systems and Applications*, 1st edition, New York, NY: Elsevier, 2019, pp. 487.
2. A. Ames, **R. Gregg**, E. Wendel, and S. Sastry, "On the Geometric Reduction of Controlled Three-Dimensional Bipedal Robotic Walkers," in *Lagrangian & Hamiltonian Methods for Nonlinear Control*, ser. Lecture Notes in Control and Information Sciences, vol. 366. Nagoya, Japan: Springer, 2007, pp. 183-196.

UNREFEREED MAGAZINE ARTICLES

1. **R. Gregg**, L. Hargrove, and J. Sensinger, "Challenges for Control Research: Control of Powered Prosthetic Legs," *The Impact of Control Technology*, 2nd ed., T. Samad and A.M. Annaswamy (eds.), IEEE Control Systems Society, 2014.
2. D. Hoelzle, A. Ford, **R. Gregg**, M. Johnson, and J. Kemmerer, "Symposium on Emerging Topics in Control and Modeling: Biomedical Systems [Conference Reports]," *IEEE Control Systems Magazine*, 30(6): 132-134, 2010.

PATENTS

1. **R. Gregg**, K. Walters, and G. Thomas, "Limb-Assistive Device with Energy Shaping and Force Amplification," U.S. Provisional Patent Application 63/875,174, filed 09/03/2025.
2. **R. Gregg**, A. Lang, S. Cheng, C. Laubscher, "Limb-Assistive Device and System with User-Wearable Interface," U.S. Provisional Patent Application 63/839,889, filed 07/05/2025.
3. **R. Gregg**, A. Seelhoff, and T.K. Best, "Powered Prosthesis with Passive Joint," U.S. Provisional Patent Application 63/798,132, filed 05/01/2025.
4. **R. Gregg**, S. Cheng, and C. Laubscher, "Powered Prosthesis and Activity Classifier," U.S. Provisional Patent Application 63/715,397, filed 11/01/2024.

5. **R. Gregg** and N. Divekar, "Limb-Assistive Device with Modified Energy Shaping," U.S. Provisional Patent Application, 2024.
6. **R. Gregg**, J. Lin, N. Divekar, G. Thomas, "Limb-Assistive Device with Energy Shaping," U.S. Patent Application, 2023.
7. **R. Gregg**, S. Cheng, C. Laubscher, "Powered Lower Limb Assistive Device with Obstacle Avoidance," U.S. Patent Application, 2023.
8. **R. Gregg**, R. Cortino, and T.K. Best, "Powered Prosthesis with Hybrid Controller for Stair Locomotion," U.S. Patent Application, 2023.
9. **R. Gregg,** T.K. Best, and C. Welker, "Powered Prosthesis with Improved Sit-Stand Transitions," U.S. Patent Application, 2023.
10. **R. Gregg** et al., "Prosthesis with Adaptive Speed and Incline Impedance Control," U.S. Patent Application, 2023.
11. E. Rouse, **R. Gregg**, R. Medrano, and G. Thomas, "A novel Transformers-based neural network to estimate human gait," U.S. Patent Application, 2023.
12. **R. Gregg** and H. Zhu, "Powered Orthosis with Combined Motor and Gear Technology," U.S. Patent Application No. 16/611,948, issued May 7, 2026.
13. **R. Gregg** and G. Lv, "Total Energy Shaping Control Methods and Devices for Powered Orthosis," U.S. Patent No. 12,144,772, Nov 19, 2024.
14. **R. Gregg**, G. Lv, and H. Zhu, "Torque Control Methods and Devices for Powered Orthosis," U.S. Patent No. 11,938,050, Mar 26, 2024.
15. **R. Gregg** et al., "Powered Prosthesis with Torque Dense, Low Ratio Actuation," U.S. Patent No. US20230398003A1, 2023.
16. **R. Gregg** and H. Zhu, "Lower Limb Powered Orthosis with Low Ratio Actuation," U.S. Patent No. US11497641B2, 2022.
17. **R. Gregg** et al., "Variable Stiffness Actuator with Electrically Modulated Stiffness," U.S. Patent No. US10870202B2, 2020.
18. **R. Gregg**, D. Quintero, A. Martin, and D. Villarreal, "Systems and Methods for Prosthetic Device Control," U.S. Patent No. US10792170B2, 2020.
19. **R. Gregg** and J. Sensinger, "Effective Shape Controller for Lower Limb," U.S. Patent No. US10314723B2, June 2019.

INVITED PRESENTATIONS

1. Delsys Wearable Robotics Webinar, Mar 2026.
2. Robotics and Control Seminar Series, Michigan State University, East Lansing, MI, Feb 2026.
3. Plenary Speaker, "Modeling, Estimation, and Control for Versatile Robotic Leg Prostheses and Exoskeletons," *Modeling, Estimation and Control Conference (MECC)*, Pittsburgh, PA, Oct 2025.
4. Keynote Speaker, "Towards Versatile Robotic Leg Prostheses and Exoskeletons: Control Theory Strikes Back," *IEEE Int Conf Robotics & Automation (ICRA)*, Atlanta, GA, May 2025.
5. Workshop on the State of the Art in Lower-Limb Exoskeletons, *IEEE Int Conf Robotics & Automation (ICRA)*, Atlanta, GA, May 2025.
6. Invited Demo (M-BLUE Exoskeletons), Amazon MARS conference (hosted by Jeff Bezos), Mar 2025.
7. IRIM Seminar, Georgia Tech University, Feb 2025.
8. ICON Seminar, Purdue University, Nov 2024.

9. Workshop on Accelerating Wearable Robotics: Advancements in Mechatronic Prostheses and Exoskeletons and Rapid Control Prototyping, *IEEE Int Conf Biomedical Robotics & Biomechatronics*, Sept 2024.
10. Robotics Institute Seminar, University of Toronto, July 2024.
11. Workshop on State of the Art in Robotic Leg Prostheses, *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Detroit, MI, Oct 2023.
12. Grizzle Fest, University of Michigan, Ann Arbor, MI, May 2023.
13. Departmental Seminar, Mechanical Science and Engineering, University of Illinois, Urbana-Champaign, IL, April 2022.
14. Aerodynamics and Control Seminar (online), Imperial College, London, UK, March 2022.
15. Workshop on Challenges and Opportunities of Human-Robot Symbiosis: from Wearable Robots to Neurorobotics, *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Prague, Czech Republic, 2021.
16. Minisymposium on Energy Shaping Control and its Applications, *SIAM Conference on Applications of Dynamical Systems*, Portland, OR, May 2021.
17. Workshop on Fielding Legged Robots off the Beaten Path, *American Control Conf*, New Orleans, LA, May 2021.
18. Workshop on State of the Art in Robotic Leg Prostheses, *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Oct 2020.
19. Invited Speaker, *Int Conf on Control, Automation and Systems*, Busan, Korea, Oct 2020.
20. Seminar, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, Sept 2020.
21. Mini-Symposium on Augmented Neural Prostheses, *IEEE Engineering in Medicine & Biology Conf*, Montreal, Canada, July 2020.
22. Workshop on Extremum Seeking Control in Biomedical Applications, *American Control Conf*, June 2020.
23. Workshop on Advances in Lower-limb Dynamic Prostheses for Agile and Dynamic Walking, *IEEE Int Conf Robotics & Automation (ICRA)*, Paris, France, May 2020.
24. Amputation Care ECHO, Walter Reed National Military Medical Center, Apr 2020.
25. Invited Speaker, International Society for Prosthetics & Orthotics (ISPO Canada) Conference, *RehabWeek*, Toronto, Canada, June 2019.
26. Invited Speaker, *Orthotics & Prosthetics Innovative Technologies Conference*, Ann Arbor, MI, May 2019.
27. Seminar, University of Texas Arlington Research Institute, Arlington, TX, Mar 2019.
28. Mini-Workshop on Cross-Disciplinary Communication and Collaboration in CPHS Research, *IFAC Conference on Cyber-Physical & Human Systems*, Dec 2018.
29. Departmental Seminar, Mechanical Engineering, University of Washington, Seattle, WA, Dec 2018.
30. Graduate Seminar, Mechanical Engineering, Texas A&M University, Nov 2018.
31. Robotics Seminar, University of Michigan, Ann Arbor, MI, Nov 2018.
32. Seminar, Burke Neurological Institute / Cornell University, White Plains, NY, Oct 2018.
33. Keynote Speaker, "Continuously parameterizing the timing and task adaptations of human locomotion for the control of powered prosthetic legs," *World Congress of Biomechanics*, Dublin, Ireland, July 2018.
34. *NIH High-Risk High-Reward Research Symposium*, National Institutes of Health, Bethesda, MD, June 2018.
35. Departmental Seminar, Mechanical Eng, University of North Carolina Charlotte, April 2018.
36. *WearRAcon*, Wearable Robotics Association, Scottsdale, AZ, March 2018.
37. GRASP Seminar, University of Pennsylvania, Philadelphia, PA, February 2018.
38. Controls Seminar, University of Michigan, Ann Arbor, MI, February 2018.
39. Keynote Speaker, "When Will Wearable Robots Enable Mobility in the Home and Community?", *Bridging the Gap*, School of Occupational Therapy, Texas Woman's University, Denton, TX, Oct 2017.

40. Workshop on Human Movement Understanding for Humanoids and Wearable Robots, *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Vancouver, Canada, Sept 2017.
41. Workshop on Adaptive Control Methods in Assistive Technologies, *IEEE Int Conf Intelligent Robots & Systems (IROS)*, Vancouver, Canada, Sept 2017.
42. *Annual Meeting of the Texas Chapter of the American Academy of Orthotists and Prosthetists*, Dallas, TX, Aug 2017.
43. Workshop on the Mechanics of Human Locomotion and the Development of Wearable Robotic Systems, *IEEE Int Conf Robotics & Automation (ICRA)*, Singapore, May 2017.
44. Graduate Seminar, Computer Science & Engineering, Texas A&M University, Feb 2017.
45. Advanced Platform Technology Center Lecture Series, Cleveland Clinic and Cleveland Department of Veteran Affairs, Dec 2016.
46. Departmental Seminar, Applied Physiology & Wellness, Southern Methodist Univ, Nov 2016.
47. Departmental Seminar, Mechanical Engineering, Vanderbilt University, Nov 2016.
48. Workshop on Assistive Robotic Devices for Dynamic Locomotion, *Robotics: Science & Systems*, Ann Arbor, MI, June 2016.
49. BME-RIC Seminar, Rehabilitation Institute of Chicago / Northwestern University, March 2016.
50. *WearRAcon*, Wearable Robotics Association, Phoenix, AZ, February 2016.
51. Robotics Seminar, Mechanical Engineering, Northwestern University, January 2016.
52. Departmental Seminar, Mechanical Engineering, University of Texas, Austin, TX, Sept 2015.
53. Exoskeleton Control Theory Sprint, Special Operations Command (SOCOM), Tampa, FL, July 2015.
54. Departmental Seminar, Mechanical Engineering, University of Washington, Seattle, WA, June 2015.
55. Keynote Speaker, "Innovation in Prosthetic and Orthotic Technology for Improved Healthcare," *Health Research Alliance Meeting* (American Heart Association), Dallas, TX, March 2015.
56. Departmental Seminar, Physical Medicine & Rehabilitation, University of Texas Southwestern Medical Center, Dallas, TX, February 2015.
57. Departmental Seminar, Physical Medicine & Rehabilitation, Children's Medical Center of Dallas, Dallas, TX, January 2015.
58. Departmental Seminar, Aerospace & Mechanical Engineering, University of Notre Dame, Notre Dame, IN, January 2015.
59. Texas Biorobotics Workshop, *ASME Dyn Sys Control Conf*, San Antonio, TX, October 2014.
60. *Burroughs Wellcome Fund Scientific Interfaces Symposium*, San Diego, CA, October 2014.
61. Dynamic Locomotion Workshop, *Robotics: Science & Systems*, Berkeley, CA, July 2014.
62. Keynote Speaker, "Initial Steps from Robot Locomotion to High-Performance Prostheses and Orthoses," *Annual Meeting Texas Assoc Orthotists & Prosthetists*, Dallas, TX, Apr 2014.
63. Departmental Seminar, Mechanical Engineering, Michigan State University, East Lansing, MI, Mar 2014.
64. *Texas Systems Day*, Texas A&M University, College Station, TX, March 2014.
65. Departmental Seminar, Computer Science and Engineering, University of Texas at Arlington, Arlington, TX, February 2014.
66. Departmental Seminar, Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL, February 2013.
67. Controls Seminar, Coordinated Science Lab, University of Illinois, Urbana, IL, Feb 2013.
68. Controls Seminar, University of Waterloo, Canada, May 2012.
69. Departmental Seminar, Bioengineering, University of Texas, Dallas, TX, February 2012.
70. Departmental Seminar, Institute of Automatic Control Engineering, Technical University of Munich, Germany, March 2011.
71. Departmental Seminar, Mechanical and Aerospace Engineering, University of Florida, Gainesville, FL, January 2011.

72. *Dynamic Walking Conference*, "Control and Planning with Asymptotically Stable Gait Primitives," Cambridge, MA, July 2010.
73. Workshop on 20 Years of Passivity-Based Control: Theory and Applications, *IEEE Conference on Decision and Control*, Shanghai, China, December 2009.

ADVISING AND MENTORING

Research Staff:

University of Michigan

1. Emily Klinkman, MS, Research Engineer, 2023-2026
   → Lab Supervisor, UM Robotics
2. Hannah Frame, MS, Research Engineer, 2021-2023
   → Nike Sport Research Lab
3. Vamsi Peddinti, MS, Research Engineer, 2018-2022
   → Embedded Systems Engineer, Micron Technology
4. Chris Nesler, MS, Research Engineer, 2016-2021
   → PhD student, University of Michigan

University of Texas at Dallas

5. Amanda Coldren, MPO (Northwestern), Research Orthotist, 2018
   → Prosthetics Resident, UT Southwestern Medical Center
6. Emma Reznick, BA (Colorado College), Postbaccalaureate Researcher, 2017-2018
   → PhD student, University of Michigan
7. Aaron Plauche, MS (UT Dallas), Research Engineer, 2015-2016
   → Mobile Robotics Design Engineer, Bastian Robotics
8. Yonatan Chatzinoff, BS (UT Dallas), Research Engineer, 2014-2015
   → UT Southwestern Medical Center

Postdoctoral Fellows:

University of Michigan

1. Ernesto Hernandez, PhD (U Illinois Chicago), Postdoc, AHA Fellow, 2024-Present
2. Curt Laubscher, PhD (Cleveland State), Postdoc, 2022-Present
3. Nikhil Divekar, PhD (UMich), Postdoc, 2023-2026
   → **Assistant Professor**, University of West Florida
4. Ryan Posh, PhD (Notre Dame), Postdoc, NIH F32 Fellow, 2024-2026
   → **Assistant Professor**, Ohio State University
5. Gray Thomas, PhD (UT Austin), Postdoc → Research Investigator, 2019-2023
   → **Assistant Professor**, Texas A&M University
6. Jianping Lin, PhD (Michigan), Postdoc, 2021-2022
   → Postdoc, Shanghai Jiao Tong University
7. Cara Gonzalez Welker (Stanford), Postdoc, 2021-2022
   → **Assistant Professor**, University of Colorado, Boulder
8. Edgar Bolivar, PhD (UT Dallas), Postdoc, 2019-2021
   → **Assistant Professor**, University of Notre Dame

University of Texas at Dallas

9. Siavash Rezazadeh, PhD (University of Alberta), Research Scientist, 2015-2019
   → **Assistant Professor**, University of Denver

10. Alireza Mohammadi, PhD (University of Toronto), Postdoc, 2016-2018
    → **Assistant Professor**, University of Michigan—Dearborn
11. Anne Martin, PhD (Notre Dame), Postdoc, 2014-2015
    → **Assistant Professor**, Penn State University
12. Akshay Nanjangud, PhD (UC Davis), Postdoc, 2013-2015

PhD Students:

University of Michigan

1. Zarif Cabrera (ROB), 2026-present
2. Rajatsurya M (ROB), 2026-present
3. Alex Rosen (ME), 2026-present
4. Tori Landrum (ME), NIH T32 NETP Fellow, 2024-present
5. Amy Lang (ME), 2024-present
6. C. Andrew Seelhoff (ME), NSF GRFP Fellow, 2023-present
7. Jiefu Zhang (ROB), 2023-present
8. Katharine Walters (ROB), NSF GRFP Fellow, 2022-present
9. Albert Lee (ROB), 2022-present
10. Jose Montes Perez (ROB), 2022-present
11. Duong Le (ROB), 2021-present (co-advised by Prof. Maani Ghaffari)
12. Emily Keller (ROB), NSF GRFP Fellow, 2021-present
13. Christopher Nesler (PhD-ROB 2025, co-advised by Prof. Elliott Rouse), Dissertation: *Design and Implementation of Backdrivable Lower Limb Exoskeletons for Broad Applications*
    → Postdoc, Cleveland Clinic
14. Ross Cortino (PhD-ROB 2025), Dissertation: *Increasing Practicality of Quasi-Direct Drive Robotic Prosthetic Legs through Control and Design Optimization*
    → Control Systems Engineer, Alpha-Otto Technologies
15. Thomas Kevin Best (PhD-ROB 2025, co-advised by Prof. Elliott Rouse), NSF GRFP Fellow, Dissertation: *The Development and Evaluation of Biomimetic Control for Robotic Lower-Limb Prostheses: Advancing Toward Real-World Clinical Use*
    → Product Designer, Össur; Research Scientist, Amazon FAIR
16. Shihao Cheng (PhD-ROB 2024), Rackham Predoctoral Fellow, Dissertation: *Controlling a Powered Knee-Ankle Prosthesis During Continuous and Automatic Transitions Between Activities*
    → Lead Control Engineer, Shift Robotics
17. Emma Reznick (PhD-ROB 2023), Dissertation: *Understanding Individuality in Human Locomotion for Configuring Powered Prosthetic Legs*
    → Research Scientist, Fauna Robotics
18. Nikhil Divekar (PhD-ROB 2023), Rackham Predoctoral Fellow, Dissertation: *Task-Invariant Control and Pre-clinical Validation of Partial Assist Exoskeletons*
    → **Assistant Professor**, University of West Florida
19. Jianping Lin (PhD-ROB 2021), Dissertation: *Optimal Task-Invariant Energetic Control for Powered Exoskeletons*
    → Postdoc, Shanghai Jiao Tong University

University of Texas at Dallas

20. Jonathan Horn (PhD-ME 2020), Dissertation: *Nonholonomic Virtual Constraints for Bipedal Locomotion*
    → Jacobs Engineering Group
21. Mark Yeatman (PhD-ME 2020), Dissertation: *Energy and Passivity Based Control for Bipeds and Assistive Walking Devices*
    → Applied Scientist, Boston Dynamics AI Institute

22. Kyle Embry (PhD-ME 2020), Excellence in Education Fellow, Dissertation: *Kinematic Modeling for Control of Agile Powered Prosthetic Legs over Continuously Varying Speeds and Inclines*
    → **Research Assistant Professor**, Northwestern University and Shirley Ryan Ability Lab
23. Saurav Kumar (PhD-EE 2020, co-advised by Prof. Nicholas Gans), Dissertation: *Extremum Seeking Control for Autonomous Periodic Systems with Applications to Lower-Limb Wearable Robots*
    → Postdoc, Carnegie Mellon University → **Assistant Professor**, IIT Jodhpur
24. Hanqi Zhu (PhD-EE 2020), McDermott Graduate Fellow, Dissertation: *Design of a Highly Backdrivable, Powered Lower Limb Orthosis for Improved Human Interaction*
    → CEO/Founder, Enhanced Robotics
25. Toby Elery (PhD-ME 2020), Dissertation: *Design and Implications of a Robotic Prosthetic Leg with Low-Impedance Actuation*
    → Principal Mechanical Engineer, Toyota North America
26. David Allen (PhD-ME 2020, co-advised by Prof. Walter Voit), Excellence in Education Fellow, Dissertation: *Design Principles for Using Dielectric Elastomer Transducers in Actuation Systems*
    → Structural Engineer, Lockheed Martin
27. Edgar Bolivar (PhD-ME 2019), Dissertation: *Robust Energy-Efficient Design of Series Elastic Actuators*
    → Postdoc, University of Michigan → **Assistant Professor**, University of Notre Dame
28. Ge Lv (PhD-EE 2018), Louis Beecherl Jr. Graduate Fellow, Dissertation: *Energy Shaping Control of Powered Lower-Limb Exoskeletons for Assistance of Human Locomotion*
    → Postdoc, Carnegie Mellon University → **Assistant Professor**, Clemson University
29. David Quintero (PhD-ME 2018), Excellence in Education Fellow, Dissertation: *Virtual Constraint Control of Powered Prosthetic Legs: Unifying the Gait Cycle*
    → **Assistant Professor**, San Francisco State University
30. Dario Villarreal (PhD-BME 2017), Conacyt Graduate Fellow, Dissertation: *Investigations of a Unified Phase Variable in Human Locomotion for Applications in Powered Prostheses*
    → **Assistant Professor**, Southern Methodist University

MS Students Supported:

University of Michigan

1. Robbie Frei (MS-ROB 2024), NSF GRFP Fellow → MIT Lincoln Labs

University of Texas at Dallas

2. Aaron Plauché (MS-ME 2015), Thesis: *A Haptic Feedback System for Phase-Based Sensory Restoration in Above-Knee Prosthetic Leg Users* → Mobile Robotics Design Engineer, Bastian Robotics
3. Mohammad Taha Ahmad (MS-EE 2019) → Systems Control Engineer, Rheem Manufacturing
4. Ryan Little (MS-ME 2020), Thesis: *Manufacturing Methods for Medium-Volume Production of Planar Dielectric Elastomer Actuators* → Optex Systems, Inc.
5. Emma Reznick (MS-BME 2020), Thesis: *Individualizing a Powered Prosthetic Leg Over Continuously Varying Tasks* → PhD student, University of Michigan
6. Nikhil Divekar (MS-BME 2020) → PhD student, University of Michigan

Undergraduate Research Awardees:

University of Texas at Dallas

1. Kayla Shepodd (BS-ME), 2019 ECS Award → Mechanical Engineer, SpaceX
2. Sara Borboa (BS-ME), 2018 Clark Scholar and 2019 UTD Award
3. Maaz Mian (BS-BME), 2018 Clark Scholar
4. Mira Jambusaria (BS-ECE), 2017 National Merit LEADER Scholar
5. Maximillian Virani (BS-BME), 2017 National Merit LEADER Scholar
6. Caleb Ho (BS-ME), 2017 Clark Scholar

7. Zelig Barber (BS-BME), 2016 Clark Scholar
8. Jack Doan (BS-ECE), 2016 UTD Award → Engineer, Rockwell Collins
9. Rebecca Macaluso (BS-BME), 2015 and 2016 UTD Award → Analyst, Toyota North America
10. Daniel Lambert (BS-ECE), 2015 UTD Award and Fall 2016 ECS Award
11. Calvin Stence (BS-ME), 2015 Clark Scholar and Spring 2016 ECS Award
12. Rafi Ayub (BS-BME), 2014 UTD Award → Ph.D. student / NSF GRFP Fellow, Stanford University
13. Toby Elery (BS-ME), 2014 ECS Award → Ph.D. student, UT Dallas
14. Pritam Shah (BS-ME), 2013 UTD Award

Undergraduate Senior Design Teams:

University of Texas at Dallas

1. Variable Stiffness Ankle-Foot Orthosis, sponsor: UTD SERVICE Lab, 2018-19
2. Orthosis and Prosthesis Testing Device, sponsor: UTSW Medical Center, 2017-18
3. Enhanced Design of Robotic Leg, sponsor: UTD Locomotor Control Systems Lab, 2017-18
4. Wearable Ankle Orthosis, sponsor: Texas Instruments, 2015-2016
5. Multi-Degree-of-Freedom Ankle-Foot Orthosis, sponsor: UTSW Medical Center, 2015-2016
6. Wearable Rehabilitation Sensor, sponsor: UTSW/Rithmio, 2014-15 **(1st place project)**
7. Amputee Gait Hip Simulator, sponsor: UTD Locomotor Control Systems Lab, 2014-15
8. Cable-Driven Perturbation Mechanism, sponsor: UTSW Medical Center, 2014
9. Powered Transfemoral Prosthetic Leg, sponsor: UTD Locomotor Control Systems Lab, 2014
10. Upper Limb Prosthetic Simulator, sponsor: UTSW Medical Center, 2013

TEACHING EXPERIENCE

Instructor, University of Michigan	2019 – Present
ROB 501: Mathematics for Robotics (Graduate)	Fa19, Fa20
ROB 599: Robot Modeling & Control (Graduate)	Wn20
ROB 510/MECH/EECS 567: Robot Kinematics & Dynamics (Graduate)	Wn21, Wn22, Wn23, Wn25
ROB 498: Robot Control (Undergraduate)	Wn24
ROB 415: Robot Control (Undergraduate)	Fa24, Fa25
Instructor, University of Texas at Dallas	2013 – 2019
MECH 4310: Systems and Controls (Undergrad)	Sp18
BMEN 4310: Feedback Systems in Biomedical Engineering (Undergrad)	Fa15, Fa17, Fa18
BMEN 6372: Engineering Systems Modeling & Simulation (Graduate)	Sp15, Sp16, Sp17
MECH/EECS 6324: Robot Control (Graduate)	Fa14, Fa16, Sp19
MECH 2330: Dynamics (Undergrad)	Fa13

Co-Instructor, Elgersburg School on Nonlinear Control (short course) — Spring 2011
Institut für Mathematik, Technical University Ilmaneu, Elgersburg, Germany

Graduate Teaching Assistant, Introduction to Robotics — Fall 2008
University of Illinois, Urbana, IL

SCHOLARLY REVIEW

Grant Reviewer/Panelist — 2014 – Present
NIH Musculoskeletal Rehabilitation Sciences (MRS) Study Section (R01, R21 awards) — 2026

NIH Bioengineering, Technology and Surgical Sciences (BTSS) Study Section (R01, R21 awards) 2025
NIH Director's Early Independence Award Program (DP5) 2023
NIH Director's New Innovator Award Program (DP2) 2022
NIH Musculoskeletal, Oral, and Skin Sciences: ZRG1 MOSS-L (11) B (R41, R43, R44 awards) 2022
National Science Foundation 2021
NIH Musculoskeletal Rehabilitation Sciences (MRS) Study Section (R01, R21 awards) 2020
National Science Foundation 2019
NIH Musculoskeletal Rehabilitation Sciences (MRS) Study Section (R01, R21 awards) 2019
NIH Musculoskeletal, Oral, and Skin Sciences: ZRG1 MOSS-V50R (R01 awards) 2019
NIH Musculoskeletal, Oral, and Skin Sciences: ZRG1 MOSS-D82 (R15 awards) 2019
National Science Foundation 2017
National Science Foundation 2016
NIH NICHD: ZHD1 DSR-K (12) 1 (SBIR R43/R44 awards) 2015
NIH NIBIB: ZEB1 OSR-F (M2) S (K awards) 2014
National Science Foundation 2014

Associate Editor, *IEEE Transactions on Biomedical Engineering* 2025 – Present

Scientific Program Committee Chair, *IEEE/RSJ Int Conf Intelligent Robots & Systems* 2023

Scientific Program Committee Member, *IEEE/RSJ Int Conf Intelligent Robots & Systems* 2022

Senior Editor, *IROS* Conference Paper Review Board 2020 – 2022

Program Committee Member, *IEEE Conf on Decision and Control* 2021

Associate Editor, *IEEE Transactions on Robotics* 2015 – 2019

Conference Editorial Board Member, IEEE Control Systems Society 2015 – 2018

Associate Editor (Conferences) 2013 – 2019
IEEE/ASME American Control Conf (2014-18), *IEEE Conf Control Tech & Applications* (2017), *IEEE Conf Decision & Control* (2016-18), *IEEE Int Conf Robotics & Automation* (2014-19), *IEEE Int Conf Intelligent Robots & Systems* (2013, 2015), *ASME Dyn Sys Control Conf* (2014-15), *Int Conf Rehab Robotics* (2025)

Journal Reviewer 2007 – Present
Annals Biomed Eng, ASME J Applied Mechanics Reviews, ASME J Biomech Eng, ASME J Dyn Sys Meas Control, ASME J Mech Design, ASME J Med Devices, Automatica, Frontiers in Neurorobotics, Frontiers in Neuroscience, IEEE/ASME Trans Mechatronics, IEEE Access, IEEE Control Systems Mag, IEEE Robotics Automation Mag, IEEE Trans Automat Control, IEEE Trans Autom Sci & Eng, IEEE Trans Biomed Eng, IEEE Trans Control Sys Tech, IEEE Trans Medical Robotics & Bionics, IEEE Trans Robotics, IEEE Trans Neural Sys Rehab Eng, Int J Robotics Res, J Biomech, J Intelligent Service Robotics, J NeuroEng Rehab, Mechatronics, Opt Control App Meth, Physica D: Nonlinear Phenom, PLoS ONE, Proceedings of the National Academy of Sciences, Robotica, Science Robotics

Conference Reviewer 2007 – Present
Amer Control Conf, ASME Dyn Sys & Control Conf, IEEE Conf Aut Sci & Eng, IEEE Int Conf Biomed Rob & Biomechatron, IEEE Conf Control Tech & App, IEEE Conf Decision & Control, IEEE Conf Robotics Biomimetics, IEEE Int Conf Eng Med Bio Soc, IEEE Int Conf Humanoid Rob, IEEE Int Conf Intelli Rob & Sys, IEEE Int Conf Rehab Rob, IEEE Int Conf Rob & Aut, IEEE Multiconf Sys & Control, IFAC World Congress, Robotics: Sci & Sys

SCHOLARLY SERVICE

Program Chair, *IEEE/RSJ Int Conf on Intelligent Robots & Systems (IROS)*, Detroit, MI 2023

Workshops Chair, *IEEE Conference on Control Technology & Applications (CCTA)*, Hawaii 2017

Workshop Organizer/Chair/Co-Chair

1. State of the Art in Lower-Limb Exoskeletons: Exploring Specificity vs. Generalizability Across Users and Activities, *IEEE Int. Conf. Robotics and Automation (ICRA)*, 2025
2. State of the Art in Robotic Leg Prostheses: Where We Are and Where We Want to Be, *IEEE Int. Conf. Intelligent Robots and Systems (IROS)*, 2023
3. State of the Art in Robotic Leg Prostheses: Where We Are and Where We Want to Be, *IEEE Int. Conf. Intelligent Robots and Systems (IROS)*, 2020
4. Workshop on Extremum Seeking Control in Biomedical Applications, *American Control Conf.*, 2020
5. Texas Bio-Robotics Workshop, *ASME Dynamic Systems & Control Conf.*, 2014
6. Symposium on Control and Modeling of Biomedical Systems, University of Illinois, Urbana, IL, 2010

Invited Session Organizer/Chair/Co-Chair

1. Invited Session on Control Theory in Legged Locomotion, *American Control Conf*, 2019
2. Invited Session on Robotic Locomotion Control, *IEEE Conf Control Tech App*, 2017
3. Invited Session on Control Theory in Legged Locomotion, *American Control Conf*, 2016
4. Invited Session on Rehabilitation Robots, *ASME Dyn Sys Control Conf*, 2015 – 2017
5. Invited Session on Control Theory in Medical Rehabilitation, *American Control Conf*, 2014

Meeting Participant

1. National Robotics Initiative Principal Investigator Meeting, Washington, DC, 2016-2021
2. National Academy of Engineering Workshop on Future of Center-Based, Multidisciplinary Engineering Research, Washington, DC, April 2016
3. CCC Workshop on the U.S. National Robotics Roadmap, San Francisco, CA, March 2016
4. U.S. Special Operations Command Exoskeleton Control Theory Sprint, Tampa, FL, 2015

Co-Chair, Technical Committee Manufacturing Automation & Robotic Control 2013 – 2014
IEEE Control Systems Society

UNIVERSITY SERVICE

Committee Chair, Search and Seminars Committee, Robotics Department 2025 – Present

Advisory Board Member, Center for Research on Learning and Teaching in Eng. 2024 – 2026

Graduate Chair, Robotics Institute, University of Michigan 2020 – 2022

Graduate Co-Chair, Robotics Institute, University of Michigan 2019 – 2020

Committee Member, University of Michigan, Ann Arbor, MI 2019 – Present
College: Nominating Committee (2024-present)

Robotics: Graduate Academics (2019-22), Executive Committee (2020-22, 2023-25), Search (2023), Undergraduate Committee (2024-25), Search and Seminars (2025-present)
Electrical & Computer Engineering: Graduate Academics (2019-20), PhD Admissions Recruiting (2019-20)

Committee Member, University of Texas at Dallas, Richardson, TX 2013 – 2019
Bioengineering: Faculty Search (2013-15), Graduate Recruiting (2014-17), Seminars (2016-18)
Mechanical Engineering: Faculty Search (2017-18), Graduate (2013-14), DSC Area (2013-19)
School of ECS: Executive Council (2018-19)
University: ECS Dean Search (2018-19), Core Facilities (2015)

Graduate Representative, Academic Senate Executive Committee 2008 – 2010
University of Illinois, Urbana, IL

INDUSTRY EXPERIENCE

Intern, The Boeing Company (Phantom Works) Summer 2008
Intern, SANYO Technology Center, San Jose, CA Summer 2006
Intern, Hewlett-Packard OuterBay Technologies, Cupertino, CA Summer 2004

TRAINING AND CERTIFICATIONS

- Certificate Series in Research Administration, University of Texas at Dallas, 2015
- NIH Responsible Conduct of Research (RCR) Training, Northwestern University, 2011

PROFESSIONAL MEMBERSHIPS

- Senior Member, Institute of Electrical & Electronics Engineers (IEEE)
  - Robotics & Automation Society
  - Control Systems Society
  - Engineering in Medicine & Biology Society