

PilwonHur

Associate Professor, School of Mechanical Engineering, Gwangju Institute of Science and Technology

123 Cheomdangwagi-ro, Buk-gu, Gwangju, 61005, Korea

✉ pilwonhur@gist.edu | 🌐 http://hurgroup.net | ☎ +82-10-3868-7549 | 📠 +82-62-715-2408

Appointments

Gwangju Institute of Science and Technology

Gwangju, Korea

ASSOCIATE PROFESSOR - MECHANICAL ENGINEERING

Dec 2020 - PRESENT

DIRECTOR - GIST-SAMSUNG INTELLIGENT MOTOR TALENT TRAINING CENTER

Feb 2023 - PRESENT

- Research Interests: Estimation and Control for Human-Robot Interaction, Free Energy Principle in Human Neuroscience, Rehabilitation Robotics/Engineering for Neurologically-Impaired Patients (e.g., Elderly, Stroke, SCI, MS) or Physically-Disabled Patients (e.g., Amputee), Dynamic Bipedal Walking, Unification of Bipedal Walking, Trajectory Optimization, Prosthetics, Exoskeleton, Sensory Augmentation, Slip/Push Recovery, Virtual/Tele Rehabilitation, Neuromechanics, Biomechanics, Motor Control, Gait, Balance, Equine-Assisted Therapy, Motion Analysis
- Teaching Interests: Robotics, Underactuated Robotics, Nonlinear Control, Geometric Control, Multivariable Control, Optimization, Dynamics, Biomechanics, Sensorimotor System for Human Movement, Estimation Theory, Functional Analysis for Engineering Optimization

Texas A&M University

College Station, TX

ASSISTANT PROFESSOR - MECHANICAL ENGINEERING

Aug 2014 - Dec 2020

Texas A&M Engineering Experiment Station

College Station, TX

CENTER FOR REMOTE HEALTH TECHNOLOGIES AND SYSTEMS

Jun 2015 - Dec 2020

University of Wisconsin-Milwaukee

Milwaukee, WI

POSTDOCTORAL RESEARCH FELLOW - CENTER FOR ERGONOMICS

Sep 2010 - Jun 2014

- Research Interests: Rehabilitation for Stroke, Neuromechanics, Biomechanics, Hand Exoskeleton, Sensory Prosthesis, VR-based Rehabilitation, Gait Analysis, Ergonomics

Education

University of Illinois at Urbana-Champaign

Urbana, IL

PH.D. MECHANICAL ENGINEERING

Aug 2006 - Dec 2010

- Fields of Specialty: Controls, Dynamics and Applied Mathematics with Emphasis on Biomechanics and Postural Control
- Dissertation: Quantification of the human postural control system to perturbations
- Advisor: Elizabeth T. Hsiao-Weckslar
- Committee Members: Karl Rosengren, Srinivasa M. Salapaka, Prashant G. Mehta

M.S. APPLIED MATHEMATICS

Aug 2008 - May 2010

- Fields of Specialty: Optimization and Algorithm
- Advisor: Karen Mortensen

Korea Advanced Institute of Science and Technology

Daejeon, Korea

M.S. MECHANICAL ENGINEERING

Sep 2004 - Aug 2006

- Fields of Specialty: Virtual Reality
- Thesis: HLA-based integration of underwater vehicle simulations using X3D multi-channel visualization and a motion platform
- Advisor: Soonhung Han
- Committee Members: Dong Soo Kwon, Jung Kim

Hanyang University

B.S. MECHANICAL ENGINEERING

Seoul, Korea

Mar 1998 - Aug 2004

- Fields of Interests: Robotics, Automatic Control, Mechatronics
- Thesis: Implementation of a clock using LEDs and inverted pendulum
- Advisor: Jahng-Hyon Park
- Summa Cum Laude

Busan High School

HIGH SCHOOL DIPLOMA

Busan, Korea

Mar 1995 - Feb 1998

- Concentration on Mathematics and Science
- Summa Cum Laude

Publication

Journal Papers (Under Review and In Prep)

- r6. Myeongju Cha, and **Pilwon Hur**, "Estimation of Gait Phase of Human Stair Descent Walking Based on Phase Variable Approach," *IEEE RA-L*, Under review
- r5. Kwonseung Cho, Kang-woo Lee, and **Pilwon Hur**, "Optimizing Toe Joint Stiffness to Improve Human-Like Walking," *Scientific Reports*, Under review
- r4. Jiyoung Jeong, and **Pilwon Hur**, "Terrain-Adaptive Locomotion Prediction and Joint Trajectory Generation for Smooth Autonomous Transitions in Transfemoral Prostheses Using Estimated Stride Length," *IEEE RA-L*, Under review
- r3. Yi-Tsen Pan, and **Pilwon Hur**, "Type of skin stretch feedback affects postural sway differently: differential information may be more effective for balance rehabilitation," *Journal of NeuroEngineering and Rehabilitation*, Under review
- r2. Mohammad Moein Nazifi, Isador H. Lieberman, Ram Haddas, and **Pilwon Hur**, "A muscle synergy approach in evaluation of the gait complexity following surgical alignment," *IEEE Trans on Neural Systems and Rehab Eng*, Under review
- r1. Veronica Knisley, Kwonseung Cho, and **Pilwon Hur**, "Preferred Jacobian Differentiation and Direct Collocation Methods for an Efficient and Accurate Bipedal Walking Gait," *Int J Control Automation Systems*, Under review

Journal Papers (Published)

- j40. Leonardo A. Elias, **Pilwon Hur**, and Gary C. Sieck, "Editorial: Towards an Understanding of Spinal and Corticospinal Pathways and Mechanisms," *Frontiers in Neurorobotics*, Vol 17, 2023
- j39. Woolim Hong, Namita Anil Kumar, Shawanee Patrick, Sunwoong Moon, and **Pilwon Hur**, "A Feasibility Study of Piecewise Phase Variable Based on Variable Toe-Off for the Powered Prosthesis Control: A Case Study," *IEEE Robotics and Automation Letters*, Vol 8, Issue 5, pp2590-2597, 2023
- j38. Woolim Hong, Jinwon Lee, and **Pilwon Hur**, "Piecewise Linear Labeling Method for Speed-Adaptability Enhancement in Human Gait Phase Estimation," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol 31, pp628-635, 2023
- j37. Woolim Hong, Namita Anil Kumar, Shawanee Patrick, Hui-Jin Um, Heon-Su Kim, Hak-Sung Kim, and **Pilwon Hur**, "Empirical Validation of an Auxetic Structured Foot With the Powered Transfemoral Prosthesis," *IEEE Robotics and Automation Letters*, Vol 7 pp11228-11235, 2022
- j36. Shawanee' Patrick, Namita Anil Kumar, and **Pilwon Hur**, "Evaluating Knee Mechanisms for Assistive Devices," *Frontiers in Neurorobotics*, Vol 16.790070, 2022
- j35. Shawanee' Patrick, Namita Anil Kumar, and **Pilwon Hur**, "Biomechanical Impacts of Toe Joint with Transfemoral Amputee using a Powered Knee-Ankle Prosthesis," *Frontiers in Neurorobotics*, Vol 16.809380, 2022
- j34. Woolim Hong, Jinwon Lee, and **Pilwon Hur**, "Effect of Torso Kinematics on Gait Phase Estimation for Enhancing Speed Adaptability," *Frontiers in Neurorobotics*, Vol 16.807826, 2022
- j33. Namita Anil Kumar, and **Pilwon Hur**, "A Handheld Gyroscopic Device for Haptics and Hand Rehabilitation," *IEEE Transactions on Haptics*, Vol 15, pp109-114, 2022
- j32. Namita Anil Kumar, Shawanee' Patrick, Woolim Hong, and **Pilwon Hur**, "Control Framework for Sloped Walking with a Powered Transfemoral Prosthesis," *Frontiers in Neurorobotics*, Vol 15:790060, 2022
- j31. Hui-Jin Um, Heon-Su Kim, Woolim Hong, Hak-Sung Kim, and **Pilwon Hur**, "Design of 3D Printable Prosthetic Foot to Implement Nonlinear Stiffness Behavior of Human Toe Joint Based On Finite Element Analysis," *Scientific Reports*, Vol

11:19780, 2021

- j30. Priscilla Lightsey, Yonghee Lee, Nancy Krenek, and **Pilwon Hur**, "Physical therapy treatments incorporating equine movement: a pilot study exploring interactions between children with cerebral palsy and the horse," *Journal of NeuroEngineering and Rehabilitation*, Vol 18:132, 2021
- j29. Jinwon Lee, Woolim Hong, and **Pilwon Hur**, "Continuous Gait Phase Estimation using LSTM for Robotic Transfemoral Prosthesis Across Walking Speeds," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Vol 29, pp1470-1477, 2021
- j28. Woolim Hong, Namita Anil Kumar, and **Pilwon Hur**, "A phase-shifting based human gait phase estimation for powered transfemoral prostheses," *IEEE Robotics and Automation Letters*, Vol 6, Issue 3, pp5113-5120, 2021
- j27. Mohammad Moein Nazifi, Kurt Beschorner, and **Pilwon Hur**, "Angular momentum regulation may dictate the slip severity," *PLOS One*, 15(3): e0230019, 2020
- j26. **Pilwon Hur**, Yi-Tsen Pan, and Christian DeBuys, "Free energy principle in human postural control system: skin stretch feedback reduces the entropy," *Scientific Reports*, Vol 9:16870, 2019
- j25. Mohammad Moein Nazifi, Kurt Beschorner, and **Pilwon Hur**, "Do walking muscle synergies influence propensity of severe slipping?," *Frontiers in Human Neuroscience*, Vol 13:383, 2019
- j24. Na Jin Seo, Vincent Crocher, Egli Spaho, Charles Ewert, Mojtaba F. Fathi, **Pilwon Hur**, Suzanne Marchant, Michelle Woodbury, Sara J. Atkinson, Elizabeth M. Humanitzki, Abigail Lauer, "Capturing Upper Limb Gross Motor Categories Using the Kinect Sensor," *American Journal of Occupational Therapy*, Vol 73, Issue 3, 2019
- j23. Mohammad Moein Nazifi, **Pilwon Hur**, Theodore Belanger, Akwasi Boah, Ram Haddas, Isador Lieberman, "The effect of surgical alignment on gait complexity in adult deformity patients: a neuromuscular synergy approach," *The Spine Journal*, Vol 18, Issue 8, S130, 2018
- j22. **Pilwon Hur**, Yi-Tsen Pan, Theodore Belanger, Isador Lieberman, Rajesh Arakal, Ram Haddas, "The effect of surgical alignment on standing balance in adult deformity patients: invariant density approach," *The Spine Journal*, Vol 18, Issue 8, S82, 2018
- j21. Mohammad Moein Nazifi, Kurt Beschorner and **Pilwon Hur**, "Association between slip severity and muscle synergies of slipping," *Frontiers in Human Neuroscience*, Vol 11:536, 2017
- j20. Han Ul Yoon, Namita Anil Kumar and **Pilwon Hur**, "Synergistic Effects on the Elderly People's Motor Control by Wearable Skin-Stretch Device Combined with Haptic Joystick," *Frontiers in Neurorobotics*, Vol 11:31, 2017
- j19. Han Ul Yoon, Ranxiao F Wang, Seth A Hutchinson, and **Pilwon Hur**, "Customizing Haptic and Visual Feedback for Assistive Human-Robot Interface and the Effects on Performance Improvement," *Robotics and Autonomous Systems*, Vol 91, pp258-269, 2017
- j18. Mohammad Moein Nazifi, Han Ul Yoon, Kurt Beschorner, and **Pilwon Hur**, "Shared and Task-Specific Muscle Synergies During Normal Walking and Slipping," *Frontiers in Human Neuroscience*, Vol 11:40, 2017
- j17. Yi-Tsen Pan, Han U. Yoon, and **Pilwon Hur**, "A Portable Sensory Augmentation Device for Balance Rehabilitation Using Fingertip Skin Stretch Feedback," *IEEE Trans on Neural Systems and Rehab Eng*, Vol 25, Issue 1, pp28-36, 2017
- j16. Na Jin Seo, Mojtaba Fathi-Firoozabad, **Pilwon Hur**, and Vincent Crocher, "Modifying Kinect Placement to Improve Upper Limb Joint Angle Measurement Accuracy," *Journal of Hand Therapy*, Vol 29, Issue 4, pp465-473, 2016
- j15. Na Jin Seo, Jayashree Arun Kumar, **Pilwon Hur**, Vincent Crocher, Binal Motawar, Kishor Lakshminarayanan, "Development and usability evaluation of low-cost hand and arm virtual reality rehabilitation games," *Journal of Rehab Research and Development*, Vol 53, Issue 3, pp1-13, 2016
- j14. **Pilwon Hur**, Kiwon Park, Karl Rosengren, Gavin Horn and Elizabeth Hsiao-Wecksle, "Effects of air bottle design on postural control of firefighters," *Applied Ergonomics*, Vol 48, pp49-55, 2015
- j13. Na Jin Seo, Marcella Kosmopoulos, Leah Enders, **Pilwon Hur**, "Effect of Remote Sensory Noise on Hand Function Post Stroke," *Frontiers in Human Neuroscience*, Vol 8:934, 2014
- j12. **Pilwon Hur**, Yao-Hung Wan, and Na Jin Seo, "Investigating the Role of Vibrotactile Noise in Early Response to Perturbation," *IEEE Trans on Biomed Eng*, Vol 61, Issue 6, pp1628-1633, 2014
- j11. **Pilwon Hur**, Binal Motawar, and Na Jin Seo, "Muscular responses to handle perturbation with different glove condition," *Journal of Electromyography & Kinesiology*, Vol 24, Issue 1, pp159-164, 2014
- j10. **Pilwon Hur**, Karl Rosengren, Gavin Horn, Denise Smith and Elizabeth Hsiao-Wecksler, "Effect of protective clothing and fatigue on functional balance of firefighters," *J Ergonomics*, S2:004, 2013
- j9. Leah R. Enders, **Pilwon Hur**, Michelle J. Johnson, and Na Jin Seo, "Remote vibrotactile noise improves light touch sensation in stroke survivors' fingertips via stochastic resonance," *Journal of NeuroEng and Rehab*, 10:105, 2013
- j8. **Pilwon Hur**, Binal Motawar, and Na Jin Seo, "Hand breakaway strength model –Effects of glove use and handle shapes on a person's hand strength to hold onto handles to prevent fall from elevation," *Journal of Biomechanics*, Vol 45, Issue

6, pp958-964, 2012

- j7. Binal Motawar, **Pilwon Hur**, James Stinear, and Na Jin Seo, "Contribution of intracortical inhibition in voluntary muscle relaxation," *Exp Brain Research*, Vol 221, Issue 3, pp299-308, 2012
- j6. **Pilwon Hur**, A. Kenneth Shorter, Prashant Mehta, and Elizabeth Hsiao-Wecksler, "Invariant Density Analysis: modeling and analysis of the postural control system using Markov chains," *IEEE Trans on Biomed Eng*, Vol 59, Issue 4, pp1094-1100, 2012
- j5. Kiwon Park, **Pilwon Hur**, Karl Rosengren, Gavin Horn, and Elizabeth Hsiao-Wecksler, "Effect of load carriage on gait due to firefighting air bottle configuration," *Ergonomics*, Vol 53, Issue 7, pp882-891, 2010
- j4. **Pilwon Hur**, Brett Duiser, Srinivasa Salapaka, and Elizabeth Hsiao-Wecksler, "Measuring robustness of the postural control system to a mild impulsive perturbation," *IEEE Trans on Neural Systems and Rehab Eng*, Vol 18, Issue 4, pp461-467, 2010
- j3. Gavin Horn, Elizabeth Hsiao-Wecksler, Karl Rosengren, **Pilwon Hur**, Kiwon Park, and Denise Smith, "Slips, trips, and falls on the fireground - A study at IFSI," *Fire Rescue*, Vol 27, Issue 1, pp56-58, 2009
- j2. **Pilwon Hur**, Byounghyun Yoo, Jeongsam Yang, and Soonhung Han, "An underwater vehicle simulator with immersive interface using X3D and HLA," *SIMULATION, Trans of the Society for Modeling and Simulation International*, Vol 85, Issue 1, pp33-44, 2009
- j1. **Pilwon Hur**, Jeongsam Yang, and Soonhung Han, "An Underwater Vehicle Simulator using X3D and a Motion Chair in a Multi-Channel Display Room," *Soc CAD/CAM Eng*, Vol 13, Issue 1, pp45-57, 2008

Conference Papers and Presentations

- c129. Jinsik Ju, Young Bae Kong, Jongchul Lee, Jeonghoon Park, **Pilwon Hur**, and Mingoo Hur, "Development of a remote control system for a syringe pump using a dynamixel motor," *ICCAS*, Oct 29-Nov 1, 2024, Jeju, Korea
- c128. Jiyoung Jeong, and **Pilwon Hur**, "Environment perception and joint trajectory generation for robotic transfemoral prosthesis," *대한기계학회 바이오공학부문 춘계학술대회*, 2024년 4월 24-26일, 여수
- c127. Hyeon Cho, and **Pilwon Hur**, "Analysis of influence of the conscious and subconscious walking on the orientation of human toe joint axis at various walking speeds," *대한기계학회 바이오공학부문 춘계학술대회*, 2024년 4월 24-26일, 여수
- c126. Wooyoung Park, and **Pilwon Hur**, "Data-driven control of gait-assistive wearable robots using GPR," *ICROS*, 2024년 7월 2-4일, 대전
- c125. 안해원, 허필원, "데이터 기반 모델링을 이용한 2-Link 인간 모델의 균형 제어," *ICROS*, 2024년 7월 2-4일, 대전
- c124. Sunghwan Bae, and **Pilwon Hur**, "Improving Nonnegative Matrix Factorization for Muscle Synergy Analysis: Minimizing Synergy Entropy," *ICROS*, 2024년 7월 2-4일, 대전
- c123. Sunwoong Moon, Myeongju Cha, Hyungseok Ryu, Kwonseung Cho, Jiyeon Sung, Kangwoo Lee, Sunghyun Kim, and **Pilwon Hur**, "State Estimation of Nonlinear System Based on Free Energy Principle," *ICROS*, 2024년 7월 2-4일, 대전
- c122. 박혜원, 허필원, "휴대용 CPM(Continuous Passive Motion) 기구 제어를 위한 딥러닝 기반 사람 관절 stiffness 추정," *ICROS*, 2024년 7월 2-4일, 대전
- c121. 정지영, 허필원, "착용형 보행보조로봇을 위한 환경인지 및 관절 경로 생성," *ICROS*, 2024년 7월 2-4일, 대전
- c120. 차명주, 허필원, "계단 하강 보행의 상태 예측을 위한 상태 변수 생성에 대한 연구," *ICROS*, 2024년 7월 2-4일, 대전
- c119. Woolim Hong, Namita Anil Kumar, Shawanee Patrick, Sunwoong Moon, and **Pilwon Hur**, "A Feasibility Study of Piecewise Phase Variable Based on Variable Toe-Off for the Powered Prosthesis Control: A Case Study," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct 1-5, Detroit, USA, 2023
- c118. HyungSeok Ryu, Woolim Hong, and **Pilwon Hur**, "Towards Realistic Prosthetic Gait Simulations: Enhancing the Accuracy of OpenSim Analysis by Integrating the Transfemoral Prosthesis Model," *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, Aug 28-31, Busan, Korea, 2023
- c117. Jinsik Ju, Junyoung Lee, Jeonghoon Park, **Pilwon Hur**, and Mingoo Hur, "Development of an Automated Program for the Radioisotope Separation and Purification System," *ICCAS*, Oct 17-20, 2023, Yeosu, Korea
- c116. 류형석, 홍우림, 허필원, "현실적인 의족 보행 시뮬레이션을 향해: 대퇴의족 모델을 통합하여 OpenSim 분석의 정확도 향상하기," *대한기계학회 바이오공학부문 춘계학술대회*, 2023년 4월 27일, 강릉
- c115. Veronica Knisley, Kwonseung Cho, and **Pilwon Hur**, "Preferred Jacobian Differentiation and Direct Collocation Method for an Efficient and Accurate Bipedal Walking Gait," *ICROS*, 2023년 6월 21일, 삼척
- c114. 류형석, 허필원, "환측의 IMU와 보행시점 정보를 활용한 보행 비대칭성과 보행 속도 추정," *대한생체역학회*, 2023년 12월 1일, 전주
- c113. 문선웅, 허필원, "aDMP based Human Gait Pattern adaptive Phase Variable Estimation," *대한생체역학회*, 2023년 12월 1일, 전주

- c112. 차명주, 허필원, “계단 하강 보행 상태 추정을 위한 상태 변수 생성,” 대한생체역학회, 2023년 12월 1일, 전주
- c111. 성지윤, 허필원, “자유 에너지의 전반적인 원리와 이해,” 대한생체역학회, 2023년 12월 2일, 전주
- c110. 조권승, 허필원, “Effect of Toe Joint on Bipedal Walking,” 대한생체역학회, 2023년 12월 2일, 전주
- c109. Woolim Hong, Namita Anil Kumar, Shawanee Patrick, Hui-Jin Um, Heon-Su Kim, Hak-Sung Kim, and **Pilwon Hur**, “Empirical Validation of an Auxetic Structured Foot With the Powered Transfemoral Prosthesis,” *IEEE RAS/EMBS International Conference on Biomedical Robotics & Biomechatronics*, Aug 21 - 24, Seoul, Korea, 2022
- c108. 홍우림, 이진원, 허필원, “다양한 속도에서의 하지 웨어러블 로봇 제어를 위한 기계학습 기반 사용자 보행 위상 추정,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c107. 조현, 엄희진, 김현수, 홍우림, 김학성, 허필원, “FEA를 통한 인간발가락 관절의 비선형 강성거동을 구현하기 위한 3D 프린팅이 가능한 의족 발,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c106. 정지영, 이진원, 홍우림, 허필원, “로봇 의족을 위한 LSTM을 이용한 여러 보행속도에서의 연속 보행단계 추정,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c105. 류형석, 홍우림, 이진원, 허필원, “보행속도에 따른 보행위상추정에 몸통 운동학의 영향,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c104. 조권승, Shawanee Patrick, Namita Anil Kumar, 홍우림, 허필원, “발가락 관절이 대퇴의족의 보행에 미치는 생체역학적 영향,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c103. 차명주, Namita Anil Kumar, Shawanee Patrick, 홍우림, 허필원, “하지 동력 의족의 경사 보행에서의 제어 프레임워크,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c102. 문선웅, 홍우림, Namita Anil Kumar, 허필원, “하지 동력 의족에서 위상 변수의 이동을 통한 인간의 보행 추정,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c101. 이진원, 홍우림, 허필원, “LSTM을 활용한 연속보행에서 보행 단계 추정,” 대한기계학회 IT융합부분 춘계학술대회, 2022년 5월25일-27일, 안동
- c100. 홍우림, 이진원, 문선웅, 허필원, “보행 속도에 따른 보행 상태 추정 향상을 위한 구간 선형 라벨링 방법 연구,” 대한생체역학회, 2022년 11월 19일, 충주
- c99. 홍우림, Namita Anil Kumar, Shawanee Patrick, 엄희진, 김현수, 조현, 김학성, 허필원, “대퇴 로봇 의족의 실험적 Auxetic Structured Foot 검증,” 대한생체역학회, 2022년 11월 18일, 충주
- c98. 조권승, 허필원, “이족보행에서 발가락 관절의 영향 시뮬레이션 연구,” 대한생체역학회, 2022년 11월 18일, 충주
- c97. Mohammad Moein Nazifi, Isador Lieberman, Ram Haddas, **Pilwon Hur**, “A muscle synergy approach in evaluation of the gait recovery following surgical alignment,” 대한생체역학회, 2022년 11월 19일, 충주
- c96. Kwonseung Cho, and **Pilwon Hur**, “Minimizing Angular Momentum Yields More Robust Walking Trajectories in a Compass-gait Walker,” *ICROS*, June 23 - 25, Yeosu, Korea, 2021
- c95. Myeong Ju Cha, Sun Woong Moon, Kwonseung Cho, and **Pilwon Hur**, “Dynamics and Control Methods for Compass-gait Walker: Tutorial of Defining EOM and Simulation Method for Undergraduates,” *ICROS*, June 23 - 25, Yeosu, Korea, 2021
- c94. Sun Woong Moon, Myeong Ju Cha, Kwonseung Cho, and **Pilwon Hur**, “Finding the Optimal Trajectory using a Direct Collocation Method for an Efficient and Accurate Compass-gait Walker for Undergraduates,” *ICROS*, June 23 - 25, Yeosu, Korea, 2021
- c93. Christian DeBuys, and **Pilwon Hur**, “Feedforward Optimal Control with Stabilizing Optimal Trajectory Tracking to Emulate Human Motor Control,” *ICROS*, June 23 - 25, Yeosu, Korea, 2021
- c92. Shawanee Patrick, Namita Anil Kumar, and **Pilwon Hur**, “Experiment Design: Evaluating Knee Mechanisms using Device Migration and Interaction Forces,” *American Society of Biomechanics*, Aug 10-13, Atlanta, GA, 2021
- c91. Woolim Hong, Namita Anil Kumar, and **Pilwon Hur**, “Toe Joint Effect on Ankle Kinematics/Kinetics under Active Control,” *American Society of Biomechanics*, Aug 10-13, Atlanta, GA, 2021
- c90. Huijin Um, Heonsu Kim, Woolim Hong, Haksung Kim, and **Pilwon Hur**, “3D-Printable Toe-joint Design of Prosthetic Foot,” *International Conference on Ubiquitous Robots*, July 12 - 14, Gangneung-si, Korea, 2021
- c89. Heonsu Kim, Huijin Um, Woolim Hong, Haksung Kim, and **Pilwon Hur**, “Structural design for energy absorption during heel strike using the auxetic structure in the heel part of the prosthetic foot,” *International Conference on Ubiquitous Robots*, July 12 - 14, Gangneung-si, Korea, 2021
- c88. Priscilla LIGHTSEY, Nancy KRENEK, Younghee LEE, and **Pilwon Hur**, “Physical Therapy Incorporating Equine Movement: Kinetic Interactions between Children with Cerebral Palsy and the Horse,” *HETI International Congress*, June 7 - 10, Seoul, Korea, 2021
- c87. Woolim Hong, Namita Anil Kumar, and **Pilwon Hur**, “A phase-shifting based human gait phase estimation for powered transfemoral prostheses,” *IEEE/RSJ International Conference on Robotics and Automation (ICRA)*, May 30 - June 5, Xian, China, 2021
- c86. Namita Anil Kumar, Woolim Hong, and **Pilwon Hur**, “Impedance Control of a Transfemoral Prosthesis on Sloped Terrain-

nusing Continuous and Nonlinear Impedance Parameters,” *IEEE/RSJ International Conference on Robotics and Automation (ICRA)*, May 30 - June 5, Xian, China, 2021

- c85. Mohammad Moein Nazifi, Theodore Belanger, Isador H. Lieberman, Ram Haddas, and **Pilwon Hur**, “Can entropy of muscle synergies help track the gait improvements in ADS patients?,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c84. Woolim Hong, Huijin Um, Heonsu Kim, Haksung Kim and **Pilwon Hur**, “Effects of material of the 3D printed foot on ankle kinematics/kinetics and toe joint bending during prosthetic walking,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c83. Jinwon Lee, Woolim Hong, and **Pilwon Hur**, “Gait Phase Estimation of Powered Transfemoral Prosthesis using RNN,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c82. **Pilwon Hur**, “A Framework for Bipedal Walking Research in Biomechanics from Robotics,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c81. Namita Anil Kumar, Woolim Hong, and **Pilwon Hur**, “Impedance Control of the Knee Mechanism of a Transfemoral Prosthetic for Level Walking,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c80. Veronica Knisley, and **Pilwon Hur**, “Optimal Bipedal Walking Gaits Found with Different Direct Collocation Settings,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c79. Heonsu Kim, Huijin Um, Woolim Hong, Haksung Kim, and **Pilwon Hur**, “3D-Printable Prosthetic Foot with Human Toe-Joint Property,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c78. Huijin Um, Heonsu Kim, Woolim Hong, Haksung Kim, and **Pilwon Hur**, “Structural behavior evaluation of prosthetic foot using the auxetic structure via finite element analysis,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c77. Yonghee Lee, Priscilla Lightsey, Nancy O’ Meara Krenek, and **Pilwon Hur**, “EXPLORING HOW FUNCTIONAL IMPROVEMENT IS RELATED TO INTERACTION BETWEEN CHILDREN WITH CEREBRAL PALSY AND HORSES DURING EQUINE-ASSISTED THERAPY: A PILOT STUDY,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c76. Patrick R. Currin, Jongyong Park, Eunyoung Kim, Chiseung Lee, Woolim Hong, Felipe C.R. Miftajov, and **Pilwon Hur**, “A preliminary study of a motion capture system using smartphones for the ankle joint analysis,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c75. Christian DeBuys, and **Pilwon Hur**, “Minimizing Angular Momentum Yields More Robust Walking Trajectories in Five-Link Biped,” *American Society of Biomechanics*, Aug 4-7, Atlanta, GA, 2020
- c74. Namita Anil Kumar, Woolim Hong and **Pilwon Hur**, “Impedance control of a transfemoral prosthesis using continuously varying ankle impedances and multiple equilibria,” *IEEE/RSJ International Conference on Robotics and Automation (ICRA)*, May 31-Jun 4, Paris, France, 2020
- c73. Kenneth Chao, and **Pilwon Hur**, “Generalized Contact Constraints of Hybrid Trajectory Optimization for Different Terrains and Analysis of Sensitivity to Randomized Initial Guesses,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Nov 4-8, Macau, China, 2019
- c72. Namita Anil Kumar, Shawanee Patrick, and **Pilwon Hur**, “Pilot Study on the Needs of Prospective Exoskeleton Users with Impaired Mobility,” *IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO)*, Beijing, China, Oct 31-Nov 2, 2019
- c71. Christian DeBuys, Yi-tsen Pan, **Pilwon Hur**, “Support for the Existence of Open-loop and Closed-loop Regions in Balance Control,” *American Society of Biomechanics/International Society of Biomechanics*, Jul 31 - Aug 4, Calgary, Canada, 2019
- c70. Mohammad Moein Nazifi, Kurt Beschorner and **Pilwon Hur**, “Does Inadequate Angular Momentum Regulation Cause Falls?,” *American Society of Biomechanics/International Society of Biomechanics*, Jul 31 - Aug 4, Calgary, Canada, 2019
- c69. Woolim Hong, Kenneth Chao and **Pilwon Hur**, “The Effect of Inclination and Walking Speed on Foot Placement for Slope Walking,” *American Society of Biomechanics/International Society of Biomechanics*, Jul 31 - Aug 4, Calgary, Canada, 2019
- c68. Namita Anil Kumar, Kenny Chour and **Pilwon Hur**, “Pilot Study with a Gyroscopic Hand Rehabilitation Device,” *American Society of Biomechanics/International Society of Biomechanics*, Jul 31 - Aug 4, Calgary, Canada, 2019
- c67. Woolim Hong, Victor Paredes, Kenneth Chao, Shawanee Patrick, **Pilwon Hur**, “Consolidated control framework to control a powered transfemoral prosthesis over inclined terrain conditions,” *IEEE/RSJ International Conference on Robotics and Automation (ICRA)*, May 20-24, Montreal, Canada, 2019
- c66. Mohammad Moein Nazifi, Kurt Beschorner and **Pilwon Hur**, “Does Inadequate Angular Momentum Regulation Cause Falls?,” *South Central American Society of Biomechanics*, April 12 - 13, Plano, TX, 2019
- c65. Woolim Hong, Kenneth Chao and **Pilwon Hur**, “The Effect of Inclination and Walking Speed on Foot Placement for Slope Walking,” *South Central American Society of Biomechanics*, April 12 - 13, Plano, TX, 2019
- c64. Christian DeBuys, Yi-tsen Pan, **Pilwon Hur**, “Support for the Existence of Open-loop and Closed-loop Regions in Balance Control,” *South Central American Society of Biomechanics*, April 12 - 13, Plano, TX, 2019
- c63. Ziqi Zhao, Christian DeBuys, **Pilwon Hur**, Hangu Park, “Sensing the Nearby? –Study the Origin of the Proximity Sensation in the Forehead of the Human,” *IEEE/EMBS Conference on Neural Engineering (NER)*, Mar 20 - 23, San Francisco, CA, 2019

- c62. Yi-Tsen Pan, Chin-Cheng Shih, Christian DeBuys, and **Pilwon Hur**, “Design of a Sensory Augmentation Walker with a Skin Stretch Feedback Handle,” *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, Aug 27-31, Nanjing, China, pp832-837, 2018
- c61. Mohammad Moein Nazifi, Kurt Beschorner and **Pilwon Hur**, “Discrepancies in Kinematics and Dynamics of Mild and Severe Slipping,” *American Society of Biomechanics*, Aug 8-11, Rochester, MN, 2018
- c60. Mohammad Moein Nazifi, **Pilwon Hur**, Theodore Belanger, Isador Lieberman, and Ram Haddas, “The Effect of Surgical Alignment on Gait Complexity in Adult Deformity Patients - A Neuromuscular Synergy Approach,” *American Society of Biomechanics*, Aug 8-11, Rochester, MN, 2018
- c59. **Pilwon Hur**, Yi-Tsen Pan, Isador Lieberman, Theodore Belanger, and Ram Haddas, “The Effect of Surgical Alignment on Standing Balance in Adult Deformity Patients –Invariant Density Approach,” *American Society of Biomechanics*, Aug 8-11, Rochester, MN, 2018
- c58. Woolim Hong, Shawanee Patrick and **Pilwon Hur**, “Effect of a Foot Pad on the Push-off and Joint Trajectories for the Powered Transfemoral Prosthesis: a Pilot Study,” *American Society of Biomechanics*, Aug 8-11, Rochester, MN, 2018
- c57. Woolim Hong, Shawanee Patrick and **Pilwon Hur**, “Effect of Toe Stiffness on the Push-off and Joint Trajectories for the Powered Transfemoral Prosthesis: a Pilot Study,” *American Society of Biomechanics*, Aug 8-11, Rochester, MN, 2018
- c56. Kenneth Chao, and **Pilwon Hur**, “A Direct Method of Trajectory Optimization for Compass Bipedal Locomotion under Terrain Uncertainty,” *Dynamic Walking*, May 21-24, Pensacola, FL, 2018
- c55. Woolim Hong, and **Pilwon Hur**, “Unified Control Framework of Transfemoral Prosthesis for Inclined Walking with Bezier Polynomials Based Optimization,” *Dynamic Walking*, May 21-24, Pensacola, FL, 2018
- c54. Kenneth Chao, and **Pilwon Hur**, “A Step Towards Generating Human-Like Walking Gait via Trajectory Optimization through Contact for a Bipedal Robot with One-Sided Springs on Toes,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Sep 24-28, Vancouver, Canada, pp4848-4853, 2017
- c53. Woolim Hong, and **Pilwon Hur**, “Transfemoral Prosthesis Control for Slope Walking with Principal Component Analysis,” *American Society of Biomechanics*, Aug 8-11, Boulder, CO, 2017
- c52. Wyatt Hahn, Tyler Marr, Moein Nazifi, and **Pilwon Hur**, “Accurate Estimation of the Kinematics Using an IMU-Based Motion Capture System,” *American Society of Biomechanics*, Aug 8-11, Boulder, CO, 2017
- c51. Namita Anil Kumar, and **Pilwon Hur**, “Design of a Compact and Portable Hand Rehabilitation Device for Stroke-Survivors,” *American Society of Biomechanics*, Aug 8-11, Boulder, CO, 2017
- c50. Moein Nazifi, Kurt Beschorner, Rakie Cham, and **Pilwon Hur**, “Walking Muscle Synergies Influence Propensity of Severe Slipping,” *American Society of Biomechanics*, Aug 8 - 11, Boulder, CO, 2017
- c49. Yi-Tsen Pan, and **Pilwon Hur**, “Interactive Balance Rehabilitation Tool with Wearable Skin Stretch Device,” *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, Aug 28-31, Lisbon, Portugal, pp489-494, 2017
- c48. Namita Anil Kumar, Han Yoon, **Pilwon Hur**, “A User-Centric Feedback Device for Powered Wheelchairs Comprising a Wearable Skin Stretch Device and a Haptic Joystick,” *2017 IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO)*, Austin, TX, March 8-10, 2017
- c47. Victor Parades, Woolim Hong, Shawanee Patrick, and **Pilwon Hur**, “Upslope walking with transfemoral prosthesis using optimization based spline generation,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct 9-14, Daejeon, Korea, pp3204-3211, 2016
- c46. Han Yoon, and **Pilwon Hur**, “An Approach to Customize Haptic Guidance for the Aged Power-Wheelchair Riders,” *ATLAS, Safe Transportation & Aging Symposium*, Ann Arbor, MI, Sep 14-15, 2016
- c45. Kenneth Chao, Matthew Powell, Aaron D. Ames, and **Pilwon Hur**, “Unification of locomotion pattern generation and control Lyapunov function-based quadratic programs,” *American Control Conference (ACC)*, Jul 6-8, Boston, MA, pp3910-3915, 2016
- c44. Kenneth Chao, and **Pilwon Hur**, “Toward general capture point-based analysis on standing, walk and slip: the connection between robotic motions to human behaviors,” *Dynamic Walking*, June 4-7, Holly, MI, 2016
- c43. Victor Parades, and **Pilwon Hur**, “Push recovery by center of pressure manipulation,” *Dynamic Walking*, June 4-7, Holly, MI, 2016
- c42. Han U. Yoon, Lanna Lytle, Yi-Tsen Pan, Woolim Hong, Daniel McGowan, and **Pilwon Hur**, “Bidirectional skin stretch feedback,” *American Society of Biomechanics*, Aug 2-5, Raleigh, NC, 2016
- c41. Shawanee Patrick, Victor Paredes and **Pilwon Hur**, “Gait symmetry of a powered transfemoral prosthesis,” *American Society of Biomechanics*, Aug 2-5, Raleigh, NC, 2016
- c40. Yi-Tsen Pan and **Pilwon Hur**, “Velocity-based sensory augmentation via fingertip skin stretch on quiet standing,” *American Society of Biomechanics*, Aug 2-5, Raleigh, NC, 2016
- c39. Han U. Yoon and **Pilwon Hur**, “Will your performance be improved by a customized haptic assistance? Check the tem-

porospatial characteristics out!,” *American Society of Biomechanics*, Aug 2-5, Raleigh, NC, 2016

- c38. Mohammad Moein Nazifi, Kurt Beschorner and **Pilwon Hur**, “Correlation between slip severity and muscle synergies of slipping,” *American Society of Biomechanics*, Aug 2-5, Raleigh, NC, 2016
- c37. Moein Nazifi, and **Pilwon Hur**, “Shared and task-specific muscle synergies during normal walking and slipping,” *American Society of Biomechanics*, Aug 5-8, Columbus, OH, 2015
- c36. Yooseok Kim, Yitsen Pan, and **Pilwon Hur**, “Design of sensory augmentation system for postural control rehabilitation,” *American Society of Biomechanics*, Aug 5-8, Columbus, OH, 2015
- c35. Yitsen Pan, Yooseok Kim and **Pilwon Hur**, “Effect of sensory augmentation via skin stretch feedback on quiet standing balance,” *American Society of Biomechanics*, Aug 5-8, Columbus, OH, 2015
- c34. Han Ul Yoon, and **Pilwon Hur**, “Effect of customized haptic feedback on navigation characteristics and performance,” *American Society of Biomechanics*, Aug 5-8, Columbus, OH, 2015
- c33. Han Ul Yoon, and **Pilwon Hur**, “Slip-related muscle synergy during human walking,” *Korean-American Biomedical Scientists Symposium*, Nov 1, Houston, TX, 2014
- c32. Hyun Gu Kang, Wenjun Li, **Pilwon Hur**, and Lewis Lipsitz, “Fall risk in older adults: Posture, distractions, and statistics in multidisciplinary teams,” *International Symposium on Biomathematics and Ecology Education and Research*, Oct, Normal, IL, 2014
- c31. Mojtaba Firoozabad, **Pilwon Hur**, and Na Jin Seo, “Determination of the optimal location of kinect sensor for upper-limb virtual rehabilitation,” *World Congress on Biomechanics*, Jul 6-11, Boston, MA, 2014
- c30. Marcella Kosmopoulos, **Pilwon Hur**, Leah Enders, and Na Jin Seo, “Effect of remote subthreshold vibrotactile noise on hand function post stroke,” *World Congress on Biomechanics*, Jul 6-11, Boston, MA, 2014
- c29. **Pilwon Hur**, Derek Kamper, and Na Jin Seo, “Optimizing cable-driven assistive glove design to help open post stroke paretic hand,” *World Congress on Biomechanics*, Jul 6-11, Boston, MA, 2014
- c28. Jayashree Arunkumar, **Pilwon Hur**, Kishor Lakshminarayanan, and Na Jin Seo, “Usability evaluation of a low-cost virtual reality rehabilitation game for stroke patients with upper limb impairment using Kinect and P5 Glove,” *World Congress on Biomechanics*, Jul 6-11, Boston, MA, 2014
- c27. **Pilwon Hur**, Seyed Hadi Salehi, and Na Jin Seo, “Development of biomechanical index finger model to predict multi-segmental grip forces for varying finger postures,” *American Society of Biomechanics*, Sep 4-7, Omaha, NE, 2013
- c26. **Pilwon Hur**, Ying-Ling Tseng, and Na Jin Seo, “Somatosensory cortex activity in response to fingertip stimulation can increase with remote subthreshold vibrotactile noise: An EEG study,” *American Society of Biomechanics*, Sep 4-7, Omaha, NE, 2013
- c25. Jayashree Arunkumar, **Pilwon Hur**, Binal Motawar, and Na Jin Seo, “Low-cost virtual reality game for upper limb rehabilitation using Kinect and P5 glove,” *American Society of Biomechanics*, Sep 4-7, Omaha, NE, 2013
- c24. Vincent Crocher, **Pilwon Hur**, and Na Jin Seo, “Low-cost virtual rehabilitation games: House of Quality to meet patient expectations,” *International Conference on Virtual Rehab*, Aug 26-29, Philadelphia, PA, 2013
- c23. **Pilwon Hur**, Yao-Hung Wan and Na Jin Seo, “Effect of vibrotactile stimulation on the response time to handle perturbation,” *Society for Neuroscience*, Oct 13-17, New Orleans, LA, 2012
- c22. **Pilwon Hur**, Daniel Lomo-Tetty and Na Jin Seo, “Improving an assistive glove for stroke survivors using advanced biomechanical model,” *Society for Neuroscience*, Oct 13-17, New Orleans, LA, 2012
- c21. **Pilwon Hur** and Kurt Beschorner, “Investigating the Link between Kinematic Deviations and Recovery Response to Unexpected Slips,” *American Society of Biomechanics*, Aug 15-18, Gainesville, FL, 2012
- c20. **Pilwon Hur**, Yao-Hung Wan, and Na Jin Seo, “Effect of Vibrotactile Stimulation on the Response Time to Handle Perturbation,” *Chicago Neuromechanics Symposium*, Apr 27, Chicago, IL, 2012
- c19. Yao-Hung Wan, **Pilwon Hur**, and Na Jin Seo, “Optimizing Rung Design to Increase Hand Breakaway Strength for Prevention of Ladder Fall,” *Chicago Neuromechanics Symposium*, Apr 27, Chicago, IL, 2012
- c18. Binal Motawar, **Pilwon Hur**, and Na Jin Seo, “Roles of cutaneous sensation and gloves with different coefficients of friction on fall recovery during simulated ladder falls,” *American Society of Biomechanics*, Aug 10-13, Long Beach, CA, 2011
- c17. **Pilwon Hur**, Binal Motawar, and Na Jin Seo, “Effects of glove and ladder rung design on prevention of ladder fall,” *American Society of Biomechanics*, Aug 10-13, Long Beach, CA, 2011
- c16. **Pilwon Hur**, Hyun Gu Kang, Lewis A. Lipsitz, and Elizabeth T. Hsiao-Wecksler, “Fall Risk Estimation of Community-Dwelling Elderly using Invariant Density Analysis,” *American Society of Biomechanics*, Aug 18-21, Brown University, RI, 2010
- c15. [Invited Talk] **Pilwon Hur**, Hyun Gu Kang, Lewis Lipsitz, and Elizabeth T. Hsiao-Wecksler, “Invariant Density Analysis of Postural Sway and Fall-Risk Estimation Model of Community-Dwelling Elderly Adults,” *World Congress on Biomechanics*, Aug 1-6, Singapore, 2010
- c14. **Pilwon Hur**, Hyun Gu Kang, Lewis A. Lipsitz, and Elizabeth T. Hsiao-Wecksler, “Invariant Density Analysis of Postural Sway

and Prospective Fall Risk in Community-Dwelling Elderly,” *American Society of Biomechanics*, Aug 26-29, Penn State University, PA, 2009

- c13. Sunghoon Shin, and **Pilwon Hur**, “Effect of Golf Swing Styles on Resultant Joint Moments of Low Body Joints and L4/L5,” *American Society of Biomechanics*, Aug 26-29, Penn State University, PA, 2009
- c12. **Pilwon Hur**, K. Alex Shorter, and Elizabeth T. Hsiao-Wecksler, “Examining quiet standing center of pressure data using invariant density analysis,” *ASME Summer Bioengineering Conference*, Jun 17-21, Lake Tahoe, CA, 2009
- c11. **Pilwon Hur**, K. Alex Shorter, and Elizabeth T. Hsiao-Wecksler, “Modeling and analysis of posturographic data using Markov chains,” *Society of Engineering Science*, Oct 12-15, University of Illinois at Urbana-Champaign, IL, 2008
- c10. **Pilwon Hur**, and Elizabeth T. Hsiao-Wecksler, “Estimating the moment of inertia of the human body as a single link inverted pendulum model,” *North American Congress on Biomechanics*, Aug 5-9, University of Michigan Ann Arbor, MI, 2008
- c9. Sunghoon Shin, **Pilwon Hur**, Jeffery Casebolt, and Young-Hoo Kwon, “Weight transfer in different golf swing styles based on swing plane: a nonlinear dynamic approach,” *International Conference on Biomechanics in Sports*, Jul 14-18, Seoul, Korea, 2008
- c8. **Pilwon Hur**, Karl Rosengren, Gavin Horn, Denise Smith, and Elizabeth T. Hsiao-Wecksler, “Effect of fatigue and protective clothing on functional balance of firefighters,” *International Society of Electrophysiology and Kinesiology*, Jun 18-21, Niagara Falls, Canada, 2008
- c7. **Pilwon Hur**, Karl Rosengren, Gavin Horn, Ted Schroeder, Sara Ashton-Szabo, and Elizabeth T. Hsiao-Wecksler, “Assessment of postural sway during multiple load and visual conditions,” *International Society of Electrophysiology and Kinesiology*, Jun 18-21, Niagara Falls, Canada, 2008
- c6. Elizabeth T. Hsiao-Wecksler, **Pilwon Hur**, and Brett A. Duiser, “Sway response and relative stability of the postural control system to an impulsive perturbation,” *Society of Engineering Science*, Oct 21-24, Texas A&M University, TX, 2007
- c5. **Pilwon Hur**, Brett A. Duiser, and Elizabeth T. Hsiao-Wecksler, “Exploring the impulse response of the postural control system,” *American Society of Biomechanics*, Aug 22-25, Stanford University, CA, 2007
- c4. **Pilwon Hur**, Seiji Naito, and Elizabeth T. Hsiao-Wecksler, “Estimating lean angle through application of the gravity line projection algorithm,” *American Society of Biomechanics*, Aug 22-25, Stanford University, CA, 2007
- c3. Hyokwang Lee, **Pilwon Hur**, Junkyu Park, and Soonhung Han, “Real-time 3D visualization of underwater vehicle simulation,” *Korean Society of CAD/CAM Engineers*, Jan 31 - Feb 2, Peoyngchang, Korea, 2007
- c2. Elizabeth Hsiao-Wecksler, Brett Duiser, and **Pilwon Hur**, “Characterizing the sway response of the human postural control system to an impulse perturbation,” *Society for Neuroscience*, Oct 14-18, Atlanta, GA, 2006
- c1. **Pilwon Hur**, and Soonhung Han, “Internet-based X3D visualization of underwater vehicle simulation,” *Korean Society for Simulation*, May 26th, Cheonan, Korea, 2006

Books & Book Chapters

- b2. **Pilwon Hur**, Kenneth Chao, and Victor Christian Paredes Cauna, “Unification of bipedal robotic walking using quadratic program-based control Lyapunov function: applications to regulation of ZMP and angular momentum” In Dan Zhang (Ed.) *Adaptive Control for Robotic Manipulators* CRC Press/Taylor & Francis Group, Boca Raton, FL, Nov 2016
- b1. **Pilwon Hur**, “Understanding the human postural control system: mathematical methods to quantify the human postural control system and the applications,” *LAMBERT Academic Publishing*, ISBN: 978-3-8484-8495-9, 2012

Invited Talks

- i75. “감각증강을 통한 보행 및 균형 향상, 그리고 보조로봇에 대한 적용 가능성,” 재활로봇 측정 및 평가 워크샵, 국립재활원, 2024년 9월 24일
- i74. “Linking neuromechanics and robotics in human movement,” *Rehabilitation Research Seminar*, National Rehabilitation Center, Korea, June 13, 2024
- i73. “The mechanisms of self-organizing systems with multi-scale embodied intelligence,” *Multi-agent workshop*, GIST, Korea, April 2, 2024
- i72. “The mechanisms of self-organizing systems with multi-scale embodied intelligence,” *Rehabilitation Robotics Workshop in Korea Robotics Conference*, Pyeongchang, Korea, Feb 21, 2024
- i71. “Towards an Understanding of Spinal and Corticospinal Pathways and Mechanisms,” *BCI & Neurorehabilitation Workshop*, National Rehabilitation Center, Seoul, Korea, Nov 9, 2023
- i70. “Free Energy Principle: A Unifying Framework for Action, Perception, and Learning of Dynamic Systems Involving Robots and/or Human Inspired by Neuroscience,” *Department of Smart Industrial Machine Technologies Seminar Series*, Korea Institute of Machinery & Materials, Daejeon, Korea, Oct 25, 2023
- i69. “Free Energy Principle: A Unifying Framework for Action, Perception, and Learning of Dynamic Systems Involving Robots and/or Human Inspired by Neuroscience,” *GIST Math*, GIST, Korea, Sep 26, 2023

- i68. "Neuromechanics in Human Robot Interaction," *LG Electronics Webinar*, Korea, Sep 26, 2023
- i67. "Human Robot Interaction," *Gwangju Science Museum*, Gwangju, Korea, Jul 19, 2023
- i66. "Human Centric Framework for the Physical Human Robot Interaction," *Suncheon Jeil High School Lecture Series*, Suncheon, Korea, Jul 5, 2023
- i65. "Understanding Linear Control Systems from the Operator-Theoretic Perspectives," *ME Seminar*, GIST, Korea, Jun 8, 2023
- i64. "Free Energy Principle in Postural Control: Analysis and Rehabilitation," *Rehabilitation Research Seminar*, National Rehabilitation Center, Seoul, Korea, Dec 14, 2022
- i63. "Introduction to Mathematica for the Mathematics Education in High School," *GSA Seminar*, Gwangju Science Academy, Gwangju, Korea, Nov 16, 2022
- i62. "Human Centric Framework for the Physical Human Robot Interaction," *Korean Minjok Leadership Academy Lecture*, GIST, Korea, Oct 26, 2022
- i61. "Bipedal Walking: Human's View vs. Robot's View" *Colloquium in Mechanical Engineering*, Seoul National University, Korea, Oct 7, 2022
- i60. "Human Centric Framework for the Physical Human Robot Interaction," *KiTech Seminar*, KiTech, Gwangju, Korea, Sep 20, 2022
- i59. "Bipedal Walking: Human's View vs. Robot's View" *ICROS Control Theory Workshop*, Inje, Korea, Sep 2, 2022
- i58. "Human Centric Framework for the Physical Human Robot Interaction," *Hyundai Motor Company Seminar*, GIST, Korea, Aug 29, 2022
- i57. "Human Centric Framework for the Physical Human Robot Interaction," *Slovakia Collaboration Seminar*, GIST, Korea, Jun 9, 2022
- i56. "Human Rehabilitation Group: From $F=ma$ to Complex Robots and Biomechanics" *Thematic Lecture: Mechanical Engineering*, Incheon POSCO High School, Incheon, May 27, 2022
- i55. "Human Centric Framework for the Physical Human Robot Interaction," *GIST ME Seminar*, GIST, Korea, Nov 26, 2021
- i54. "Physical therapy treatments incorporating equine movement: a pilot study exploring interactions between children with cerebral palsy and the horse," *Korean Association of Therapeutic Horsemanship*, Samsung Medical Center, Korea, Nov 20, 2021
- i53. "Human Centric Framework for the Physical Human Robot Interaction," *GIST-LG Conference*, GIST, Korea, Nov 19, 2021
- i52. "Linking Neuromechanics and Robotics in Human Movement," *Colloquium in Mechanical Engineering*, Seoul National University, Korea, April 16, 2021
- i51. "Linking Neuromechanics and Robotics in Bipedal Walking," *Korean Society of Sport Biomechanics*, Hallym University, Korea, Dec 18 - 19, 2020
- i50. "Motor Control and Rehabilitation of Human Movement," *Kinesiology Seminar*, Seoul National University, Korea, June 24, 2020
- i49. "Dynamics and Control of Robust Bipedal Walking," *ME Seminar*, GIST, Gwangju, Korea, June 16, 2020
- i48. "Motor Control and Rehabilitation of Human Movement," *Robotics Seminar*, DGIST, Daegu, Korea, June 12, 2020
- i47. "Academic Careers in the United States," *Colloquium in Mechanical Engineering*, Seoul National University, Korea, May 15, 2020
- i46. "Human Robot Interaction for Rehabilitation," *NSF Workshop on Human-Friendly Robots*, University of Texas San Antonio, San Antonio, TX, May 2-3, 2019
- i45. "Human Robot Interaction and Free Energy Principle," *Technology Collaboration Center*, NASA JCS, Houston, TX, March 28, 2019
- i44. "Links between Robotics and Biomechanics for Gait and Balance Rehabilitation," *TAMU Kinesiology Seminar Series*, College Station, TX, Nov 16, 2018
- i43. [Key Note]"Links between Robotics and Biomechanics for Gait and Balance Rehabilitation," *Southwest Texas Asian Symposium*, Corpus Christi, TX, Nov 2, 2018
- i42. "Young Generation Forum: How to survive in academia," *KSEA*, Houston, Aug 25, 2018
- i41. "Effect of toe stiffness on the push-off and joint trajectories for the powered transfemoral prosthesis," *UKC 2018*, New York, Aug 3, 2018
- i40. "Rehabilitation robotics for human locomotion," *Mechanical Engineering, University of Cape Town*, Cape Town, South Africa, Jun 27, 2018
- i39. [Key Note]"Optimality in human balance and walking," *IX International Seminar of Biomedical Engineering*, Uniandes, Bogota, Colombia, May 17, 2018

- i38. [Lecture with Certificate]“Modeling and control of human balance and walking,” *IX International Seminar of Biomedical Engineering, Uniandes*, Bogota, Colombia, May 16, 2018
- i37. “Enhancing biomechanics of prosthetic walking with the powered transfemoral prosthesis,” *Orthotic & Prosthetic Innovative Technologies Conference*, University of California, San Francisco, May 12, 2018
- i36. “Robotics Research in Human Rehabilitation: Gait and Balance,” *Mechanical Engineering Seminar, University of Texas at San Antonio*, San Antonio, TX, Mar 30, 2018
- i35. “Robotics Research in Human Rehabilitation: Gait and Balance,” *College of Engineering Seminar, TAMU Corpus Christi*, Corpus Christi, TX, Mar 29, 2018
- i34. “Robotics Research in Human Rehabilitation: Gait and Balance,” *Informational for TURTLE Meeting, TAMU*, College Station, TX, Mar 21, 2018
- i33. “Mechanical Engineering for Rehabilitation Robotics,” *MEEN 289 Seminar, TAMU*, College Station, TX, Nov 10, 2017
- i32. “Optimality and Robustness of Human Walking and Balance,” *Department of Biomedical Engineering*, University of Los Andes, Bogota, Colombia, Jun 12, 2017
- i31. “Enhancing Balance of the Aged Workers Via Sensory Augmentation Toward the Reduction of Injuries Due to Falls,” *NIOSH ERC Pilot Projects Research Symposium*, UTHHealth School of Public Health, Houston, TX, Jun 2, 2017
- i30. “Neuro/Biomechanics for Gait and Balance Rehabilitation,” *Korean Aggies Bio Association*, Texas A&M University, College Station, TX, Apr 28, 2017
- i29. [Key Note]“Gait and Balance Rehabilitation,” *South Central ASB Regional Conference*, Texas Back Institute, Plano, TX, Apr 1, 2017
- i28. “Robotics in Gait and Balance Rehabilitation,” *Health Science Seminar, University of Houston*, Houston, Feb 14, 2017
- i27. “Neuro/biomechanics and its application in robotics,” *MEEN 681 Seminar, TAMU*, College Station, TX, Jan 25, 2017
- i26. “Gait and Balance Rehabilitation,” *West Gulf Coast Regional Conference, Korean-American Scientists and Engineers Association*, Houston, Nov 19, 2016
- i25. “Human-Like Walking and its Robustness to Perturbations,” *Robotics Engineering, DGIST*, Daegu, Korea, Oct 17, 2016
- i24. “Linking Robotics and Neuro/Biomechanics,” *Mechanical Engineering, Hanyang University*, Seoul, Korea, Oct 14, 2016
- i23. “Neuro/biomechanics and its applications in Rehabilitation Robotics,” *Mechanical Engineering, GIST*, Gwangju, Korea, Oct 13, 2016
- i22. “Neuro/biomechanics and its applications in Robotics,” *Mechanical Engineering, KAIST*, Daejeon, Korea, Oct 12, 2016
- i21. “Muscle Synergy as a Rehabilitation Tool,” *The 1st Kinesiology Seminar, Seoul National University*, Seoul, Korea, Oct 10, 2016
- i20. “Usage of MATLAB in rehabilitaiton robotics,” *Workshop on Scientific Computing with MATLAB at Texas A&M in conjunction with Dr. Cleve Moler’s Talk on Evolution fo MATLAB*, College Station, TX, Apr 25, 2016
- i19. “From F=ma to complex robots and biomechanics,” *MEEN Informational hosted by Mechanical Engineering Leadership Council*, College Station, TX, Mar 31, 2016
- i18. “Development of wearable balance rehabilitation device for the low-income elderly adults in Seoul,” *Seoul City Forum, US-Korea Conference*, Atlanta, GA, Jul 31, 2015
- i17. “Collaboration with human rehabilitation group,” *Lynntech*, College Station, TX, May 6, 2015
- i16. “Artificial sensory augmentation via skin stretch feedback and its effect in postural control,” *TAMU ENG-LIFE 2015 Workshop, TAMU*, College Station, TX, Apr 24, 2015
- i15. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *Kinesiology Seminar, TAMU*, College Station, TX, Feb 20, 2015
- i14. “Upper and lower limbs rehabilitation for the elderly and neurologically impaired patients,” *Korea Institute of Industrial Technology*, Seongnam, Korea, Aug 14, 2014
- i13. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *GIST*, Gwangju, Korea, Aug 13, 2014
- i12. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *Korea Institute of Industrial Technology*, Ansan, Korea, Jul 30, 2014
- i11. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *Kyunghee University*, Suwon, Korea, Jul 30, 2014
- i10. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *KAIST*, Daejeon, Korea, Jul 22, 2014
- i9. “Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life,” *Ajou University*, Suwon, Korea,

Jul 21, 2014

- i8. "Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life," *University of Tennessee-Knoxville*, Knoxville, TN, Feb 17, 2014
- i7. "Optimality of human movement: diagnosis and rehabilitation for enhanced quality of life," *Texas A&M University*, College Station, TX, Feb 11, 2014
- i6. "Improving quality of life: understanding fall mechanisms and potential fall preventions," *Florida International University*, Miami, FL, Nov 6, 2013
- i5. "Improving assistive gloves for stroke survivors using dynamic biomechanical models and optimization," R24-Engineering for Neurological Rehabilitation Meeting, *Rehabilitation Institute of Chicago*, Chicago, IL, Jun 16, 2013
- i4. "Upper and lower limbs rehabilitation for the neurologically impaired patients," *DGIST*, Daegu, Korea, Feb 1, 2013
- i3. "How mechanical noise enhance human sensation?," Series of Seminars at the Center for u-Healthcare, *Soon Chun Hyang University*, Asan, Korea, Oct 29, 2012
- i2. "Rehabilitation of the patients with physical weakness and neurologic impairments," *Hanyang University*, Seoul, Korea, Oct 27, 2012
- i1. "Sensory enhancement via vibrotactile stimulation and its effect on the motor response post stroke," *DGIST*, Daegu, Korea, Oct 22, 2012

Exhibition

- e1. Hyojin Jang, **Pilwon Hur**, Jinsil Hwaryoung Seo, "Lotus Flower, the Public Art," *24th International Symposium on Electronic Art*, Durban, South Africa, Jun 23 - 30, 2018

Patent

- Daniel McGowan, and **Pilwon Hur**, "Light Weight, Modular, Powered Transfemoral Prosthesis." US11596530B2, March 7th, 2023
- Daniel McGowan, and **Pilwon Hur**, "Light Weight, Modular, Powered Transfemoral Prosthesis." International Patent (PCT), WO/2019/118534, filed Dec 12, 2018
- **Pilwon Hur**, and Namita Anil Kumar, "Portable Gyroscopic Devices and Methods." U.S. Patent 62/413,130, filed Oct 26, 2016

Research Experience

Gwangju Insitute of Science and Technology

Gwangju, Korea

ASSOCIATE PROFESSOR

Dec 2020 - PRESENT

- Development of a control framework that unifies the action, estimation, and learning via FEP
- Design and control of exoskeleton for the hemiparetic patients
- Design and control of robotic knee assistive device using FEP
- Human-robot interaction, recognition of intent and trust via FEP
- Trajectory optimization of the bipedal systems for the human-like walking on various terrains with uncertainties
- Robotic rehabilitation framework using myoelectric control interface with skin stretch feedback for the upper limb deficiency patient
- Design and control of robotic transfemoral prosthesis
- Control of bipedal robotic walking with slip/push recovery
- Balance rehabilitation using sensory augmentation via skin stretch feedbacks
- Muscle synergy analysis and rehabilitation for human movement
- Analysis and design of toe joint for natural human and robotic walking
- Real time estimation of human joint impedance
- Development of tools for motion detection and analysis of national archery athletes
- Development of automatic scoring systems for archery competitions

Texas A&M University*College Station, TX***ASSISTANT PROFESSOR***Aug 2014 - Dec 2020*

- Human-Robot Interaction, Recognition of Intent and Trust via Free Energy Principle
- Trajectory optimization of the bipedal systems for the human-like walking on various terrains with uncertainties
- Robotic rehabilitation framework using myoelectric control interface with skin stretch feedback for the upper limb deficiency patient
- Design and control of robotic transfemoral prosthesis
- Shared control of the exoskeleton with compliant human-robot interaction
- Control of bipedal robotic walking with slip/push recovery
- Upper limb rehabilitation for the stroke survivors using gyroscopic effect
- Balance rehabilitation using sensory augmentation via skin stretch and electrotactile feedbacks
- Identification of cognitive status of the cerebral palsy patients and its efficacy on the equine-assisted therapy
- Development of the sensors for real-time monitoring of the equine-assisted therapy
- Haptic customization for the novice wheelchair driver for optimal performance
- Free energy principle for neuroscience and its application to human gait and balance
- Muscle synergy-based analysis and rehabilitation for slipping
- Robotic surface grinding

University of Wisconsin-Milwaukee*Milwaukee, WI***POSTDOCTORAL RESEARCH FELLOW***Sep 2010 - Jun 2014*

- Identification of mechanism of sensory enhancement due to vibrotactile stimulation using EEG
- Design and biomechanical analysis of an exoskeleton glove for the hand rehabilitation for stroke patients
- Somatosensation enhancement and its effect on motor performance post stroke
- Validation of Microsoft kinect for upperlimb rehabilitation
- Development and usability test for virtual rehabilitation games for stroke patients
- Development of devices for quantifying biceps spasticity for stroke survivors
- Investigation of Botulinum toxin of the long finger flexor muscles on grip force control and muscle activation post stroke
- Design of a unilateral repetitive motion device (URMD) for the hand rehabilitation for stroke patients
- Effect of vibrotactile stimulation on tactile sensation post stroke
- Investigation of the role of sensory systems in detecting slip and fall accidents
- Investigation of the effect of cutaneous sensory enhancement on the reaction time to perturbation
- Optimal handle design and the breakaway strength to prevent falls from the elevation
- Investigation of the contribution of intracortical inhibition during voluntary muscle contraction
- Investigation of the effect of the handle shapes and coefficient of friction on breakaway strength
- Investigation of the effect of cutaneous sensation and friction coefficients on reaction time to handle perturbation

University of Illinois at Urbana-Champaign*Urbana, IL***RESEARCH ASSISTANT***Aug 2006 - Dec 2010*

- Development of a fall risk prediction model of the elderly
- Development of a novel stochastic method for analyzing center of pressure movement using Markov chains
- Investigation of the effect of air bottle configuration on the balance and gait performance of the firefighters
- Design of foot clearance sensing device.
- Investigation of the effect of fatigue on the balance of the firefighters
- Development of an assessment tool for functional balance of the firefighters after strenuous activities
- Development of a novel method for robustness quantification of the human postural control system to an external perturbation

- Integration of underwater vehicle simulators with multi-channel display system and motion platform over HLA (High Level Architecture)
- Integration of virtual environments for national science museum

Research Grants

- g19. Pilwon Hur (PI) "Preliminary research on obstacle avoidance and path planning of robot cleaners," LG electronics, May 2024 - Jul 2024
- g18. Pilwon Hur (Co-PI) "AI-based Platform for Motion Analysis and Data Integration for Improving National Archery Performance," Ministry of Culture, Sports and Tourism, Jun 2023 - May 2025
- g17. Pilwon Hur (Co-PI) "Development of AI-based Exoskeleton Robots for the Lower Limb Rehabilitation for the Hemiplegic Patients," Ministry of Health and Welfare, April 2023 - Nov 2025
- g16. Pilwon Hur (PI) "Enhancing Performance of Wearable Lower Limb Assistive Robots using Sensorimotor Control Theory," Ministry of Health and Welfare, April 2023 - Nov 2025
- g15. Pilwon Hur (PI) "Development of smart rehabilitation robots to resolve joint rigidity," Sunhan Hospital, Nov 2022 - Oct 2024
- g14. Pilwon Hur (PI) "Development of human-robot interaction systems for lowerlimb amputee patients," GIST, Jan 2021 - Dec 2022
- g13. Pilwon Hur (PI), James Hubbard (Co-PI) "Framework Development of Equine-Assisted Therapy for Children with Cerebral Palsy," MEEN Research Priming Seed Grant, April 2019 - April 2020
- g12. Pilwon Hur (Co-PI), "Robotic Surface Grinding," Advanced Robotics Manufacturing (ARM) Institute, Sep 2018 - Nov 2019
- g11. Deanna Kennedy (PI), Pilwon Hur (Co-PI), Li Zeng (Co-PI) "Integrated Feedback And Augmented Reality For Individuals With Motor Impairments," Texas A&M Triads for Transformation (T3), Jan 2019 - Dec 2020
- g10. Pilwon Hur (PI), "Biomechanical Consideration of the Lower Limb Mobility Assistive Devices," National Science Foundation (NSF) AGEP, Sep 2018 - Jan 2019
- g9. Pilwon Hur (PI), "A Low-Cost Motion Capture System using Smartphones to Resolve Healthcare Issues in Low-Income Countries," Aggie Challenge, Sep 2018 - May 2020
- g8. Pilwon Hur (PI), Duane Steward, Nancy Krenek, Priscilla Lightsey, "Tracking kinematic and kinetic data during horse riding for optimizing therapeutic outcomes," Horses and Humans Research Foundation (HHRF), Jan 2018 - Jun 2019
- g7. Pilwon Hur (PI), Reza Langari (Co-PI), Byung-Jun Yoon (Co-PI) "Robotic rehabilitation framework for the upper limb deficiency patient via myoelectric control interface with skin stretch feedback," PESCA, Division of Research, TAMU, May. 2017 - Apr. 2018
- g6. Pilwon Hur (PI), "Enhancing balance of the aged workers via sensory augmentation toward the reduction of injuries due to falls," NIOSH, Pilot Project Research Training, 5T42OH008421, Jul. 2016 - Jun. 2017
- g5. Pilwon Hur (PI), "Effect of enhancement of somatosensation on hand function post stroke," American Heart Association (AHA), Postdoc Fellowship, 12POST12090039, Jul. 2012 - Jun. 2014
- g4. Na Jin Seo (PI), Pilwon Hur (Co-I), "Improving assistive gloves for stroke survivors using dynamic biomechanical models and optimization," NIH R24- Rehabilitation Engineering Research Network Center, Jul. 2012 - Jun. 2013
- g3. Pilwon Hur (PI), "Development of a biomechanical hand model to predict multi-segmental finger flexion forces," NIOSH, Pilot Project Research Training, T42-OH008672, Jul. 2012 - Jun. 2013
- g2. Pilwon Hur (PI), "Prevention of ladder fall by improved somatosensation and optimal rung design," National Institute for Occupational Safety and Health (NIOSH), Pilot Project Research Training, T42-OH008672, Jul. 2011 - Jun. 2012
- g1. Tchekanov (PI), Na Jin Seo (Co-PI), Pilwon Hur (Co-I), "Effect of botulinum toxin of the long finger flexor muscles on grip force control following stroke," Physical Medicine and Rehabilitation at Medical College of Wisconsin, Jan. 2011 - Dec. 2013

Teaching Experience

Gwangju Institute of Science and Technology

ASSOCIATE PROFESSOR

Gwangju, Korea
Dec 2020 - PRESENT

- t6. MC2103: Dynamics - FA2021, FA2022, FA2023, FA2024
- t5. MC3215: Mechanical Signals and Systems - SP2021, SP2022, SP2023, SP2024, SP2025
- t4. ME5160: Advanced Dynamics - SP2023
- t3. ME5166: Intelligent Motor Integration Project - FA2023
- t2. ME5169: Mathematical Foundations of Optimization in Robotics - SP2025
- t1. ME8102: Multivariable Robust Control - SP2024

Texas A&M University

ASSISTANT PROFESSOR

College Station, TX
Aug 2014 - Dec 2020

- t8. MEEN357: Engineering Analysis for Mechanical Engineers - SU2019, SU2020
- t7. MEEN364: Dynamic Systems and Controls - SP2015
- t6. MEEN404: Engineering Laboratory - FA2018
- t5. MEEN408/612: Introduction to Robotics/Mechanics of Robotic Manipulators - FA2014, FA2015, FA2016, FA2017, SP2020
- t4. MEEN431: Advanced System Dynamics and Controls - FA2016, FA2017, FA2019
- t3. MEEN651: Control System Design - FA2018, FA2019
- t2. MEEN652: Multivariable Control System Design - SP2017, SP2018, SP2019
- t1. MEEN655: Design of Nonlinear Control Systems - SP2016

Short Lectures, Crash Courses

ASSISTANT PROFESSOR

-
Aug 2014 - PRESENT

- t9. Trajectory optimization for bipedal walking using direct collocation, Tutorial for MEEN grad students, 1/17/2020, 1/24/2020, 1/31/2020
- t8. Unified Approach for Optimal Control using Functional Analysis, Tutorial for MEEN grad students, Dec, FA2019
- t7. Optimal Control (Calculus of Variation, Dynamic Programming, Pontryagin's Minimal Principle), Directed Study, SU2018, SP2019
- t6. Tutorial on Julia, the Computational Programming Language for MEEN grad students, 9/28/2018
- t5. Short Lecture on Bipedal Locomotion with HurToolbox, University of los Andes, Colombia, 5/16/2018
- t4. Short Lecture on Multivariable (Robust and Optimal) Control for MEEN grad students, 5/10/2018
- t3. Crash Course on Dynamics - Newtonian, Lagrangian, Hamiltonian and Kane's Mechanics for MEEN grad students, 1/10/2018
- t2. Crash Course on Robot Operating System (ROS) for MEEN grad students, 8/19/2016
- t1. Short Lecture and Tutorial on Passive Dynamic Walking for MEEN grad students, 12/12/2014

University of Illinois at Urbana-Champaign

INSTRUCTOR/TEACHING ASSISTANT

Urbana, IL
Aug 2006 - Dec 2010

- t4. ME340: Dynamics of Mechanical Systems (Instructor) - SU2009
- t3. ME360: Signal Processing - FA2009
- t2. TAM212: Introduction Dynamics - FA2008, SP2009
- t1. ME460: Industrial Control Systems - FA2006

Advising

Student Advising

POSTDOCTORAL RESEARCHERS

- a3. Kangwoo Lee (Ph.D. from Yonsei University) - Biomechanics of Human Movement, Oct 2023 - Present
- a2. Jinwon Lee (Ph.D. from Ajou University) - Deep learning for bipedal walking, (Currently, Assistant Professor at Gangneung-

Wonju National University, Wonju, Korea), Feb 2020 - Jan 2021

- a1. Han U. Yoon (Ph.D. from UIUC) - Haptic customization for training and rehabilitation, (Currently, Assistant Professor at Yonsei University, Wonju, Korea), Sep 2014 - Jun 2017

PH.D. STUDENTS

- a17. Van Thanh Nguyen - Design and control for dynamic 3D bipedal robotic walking Expected to graduate in Feb 2029
- a16. Hyewon Park - Joint impedance estimation Expected to graduate in Feb 2029
- a15. Hyung-Seok Ryu - FEP in robotic control Expected to graduate in Feb 2028
- a14. Sunwoong Moon - Phase variable estimation Expected to graduate in Feb 2028
- a13. Myeongju Cha - Control of transfemoral prosthesis Expected to graduate in Feb 2028
- a12. Kwonseung Cho - Control of lower limb exoskeleton, Expected to graduate in Feb 2027
- a11. Jinsik Ju - Control of robotic manipulators for safety in cyclotron, Expected to graduate in Feb 2027
- a10. Jiyeon Sung - Control of bipedal robots, Expected to graduate in Feb 2028
 - a9. Woolim Hong - User- and speed-adaptability enhancement of user gait phase estimation for robotic transfemoral prosthesis control, (Currently, Post doc, North Carolina State University, Raleigh, NC), **Graduated in May, 2022**
- a8. Shawanee Patrick - Improving the design metrics of walking assistive devices, (Currently, Post doc, The Ohio State University, Columbus, OH), **Graduated in Dec 2021**
- a7. Namita Anil Kumar - Towards better user customization of lower-limb assistive devices: data driven control strategies and a self-aligning knee mechanism, (Currently, Senior Robotics and Controls Engineer, Johnson and Johnson, Redwood City, CA), **Graduated in Dec 2021**
- a6. Moein Nazifi - Muscle synergy based rehabilitation for slipping perturbation, (Currently, Postdoctoral Research Scientist at Harvard Medical School), **Graduated in Dec 2020**
- a5. Kenneth Chao - Dynamic bipedal robotic walking with human-like behavior, (Currently, Control Engineer at Flexiv Robotics), **Graduated in May 2019**
- a4. Yitsen Pan - Balance and gait rehabilitation using portable skin stretch feedback, (Currently, Postdoctoral Research Scientist at Georgia Tech), **Graduated in May 2019**
- a3. Christian DeBuys - Control of lower limb exoskeleton for paraplegic patients, Expected to graduate in May 2022
- a2. Dongil Shin - Changed Research Topic with Dr. Palazzolo on Dec 2015
- a1. Yooseok Kim - Stopped Studying due to Personal Reasons on April 2015

M.S. STUDENTS

- a21. Sunghwan Bae, GIST, Expected to graduate in Aug 2026
- a20. Minseok Kim, GIST, Expected to graduate in Aug 2026
- a19. Moonyoung Yim, GIST, Expected to graduate in Aug 2025
- a18. Sunghyun Kim, GIST, Expected to graduate in Aug 2025
- a17. Hyewon Park, GIST, changed to direct PhD program in Aug 2024
- a16. Hyeon Cho, GIST, **Graduated in Feb 2025**
- a15. Jiyoung Jeong, GIST, **Graduated in Aug 2024**
- a14. Hyung-Seok Ryu, GIST, **Graduated in Feb 2024**
- a13. Myeongju Cha, GIST, **Graduated in Feb 2024**
- a12. Sunwoong Moon, GIST, **Graduated in Feb 2024**
- a11. Yejin Kang, GIST, Stopped studying due to personal reasons on Oct 2021
- a10. Kwonseung Cho, GIST, **Graduated in Aug 2023**
 - a9. Felipe Constantín Reyes Miftajov, **Graduated in Dec 2020**
- a8. Veronica Knisley - Numerical methods for trajectory optimization and control of bipedal walking (Currently at Southwest Research Institute, San Antonio, TX), **Graduated in May 2020**
- a7. Yonghee Lee - Human-animal interaction during Hippotherapy, (Currently at LG Innotek, Korea) **Graduated in Dec 2019**
- a6. Kenny Chour - Electrotactile display and rehabilitation (Currently, Senior Software Engineer, NASA Ames Research Center, USA), **Graduated in May 2018**
- a5. Woolim Hong - Unifying walking control of transfemoral prosthesis for various slopes (Currently, continuing PhD at A&M),

Graduated in Dec 2017

- a4. Namita Anil Kumar - Design of upper limb rehabilitation device for stroke patients using gyroscopic effect (Currently, continuing PhD at A&M), **Graduated in Aug 2017**
- a3. Daniel McGowan - Design of hybrid transfemoral prosthesis (Currently, at HX5 at Houston), **Graduated in May 2017**
- a2. Shawanee Patrick - Biomechanical analysis of lower limb powered prosthesis (Currently, continuing PhD at A&M), **Graduated in Aug 2016**
- a1. Victor Christian Paredes Cauna - Upslope walking with transfemoral prosthesis using optimization based spline generation (Currently, running a startup company, Lima Bionics, in Peru), **Graduated in May 2016**

UNDERGRADUATE STUDENTS

- a34. Sunghwan Kim - GIST, Jan 2024 - Current
- a33. Minseok Kim - GIST, Mar 2024 - Current
- a32. Leaheon Kim - GIST, Jan 2023 - Current
- a31. Hyeonwoo Lee - GIST, Jan 2022 - Current
- a30. Wooyoung Park - GIST, Sep 2022 - Aug 2024
- a29. Sunghwan Bae - GIST, Sep 2022 - Aug 2024
- a28. Seungyun Lee - GIST, Mar 2022 - Feb 2023
- a27. Haewon An - GIST, Jan 2022 - Aug 2024
- a26. Juyeong Hong - GIST, Sep 2021 - Aug 2022
- a25. Junhyeok Im - GIST, Sep 2021 - Feb 2025
- a24. Myoungju Cha - GIST, Jan 2021 - Feb 2022
- a23. Sunwoong Moon - GIST, Jan 2021 - Feb 2022
- a22. Jordan Jimenez - Aggie Challenge, Sep 2018 - May 2019
- a21. Seung Jin Kim - Aggie Challenge, Sep 2018 - May 2019
- a20. Chiseung Lee - Aggie Challenge, Sep 2018 - May 2019
- a19. Kayoung Lee - Aggie Challenge, Sep 2018 - May 2019
- a18. Wookhyun Park - Aggie Challenge, Sep 2018 - May 2019
- a17. Katya Anastasia Cope - Aggie Challenge, Jan 2019 - May 2019
- a16. Hayoung Jeon - Aggie Challenge, Jan 2019 - May 2019
- a15. Patrick Currin - Aggie Challenge, Jan 2019 - May 2019
- a14. Ruben Monterrosa - Aggie Challenge, Jan 2019 - May 2019
- a13. Reuben Ninan - Aggie Challenge, Jan 2019 - May 2019
- a12. Jack Hays - Aggie Challenge, Sep 2018 - Dec 2018
- a11. Jae Young Jun - Aggie Challenge, Sep 2018 - Dec 2018
- a10. Michael McClure, Sep 2017 - May 2018
- a9. Klayton Whittler, Sep 2017 - May 2018
- a8. Lanna Lytle, Jan 2015 - May 2018
- a7. Tyler Marr - Development of an IMU-based motion capture system, control of a robotic manipulator for the upper limb deficient patients, May 2016 - Aug 2017
- a6. Wyatt Hahn - Development of an IMU-based motion capture system, Sep 2016 - May 2017
- a5. Seungjun Lee - Validation of the optimal design of an assistive glove for stroke patients, Jan 2017 - May 2017
- a4. Ian De Vlaming, Sep 2015 - May 2016
- a3. Shyla Escobedo, Jan 2015 - May 2016
- a2. Michelle Petersen, Jan 2015 - Dec 2015
- a1. Tyler Martin, Jan 2016 - May 2016

Visiting Scholars and Interns

VISITING SCHOLARS

- a1. Hak Sung Kim - Associate Professor, Mechanical Engineering, Hanyang University, Seoul, Korea, Apr 2017 - Feb 2018

INTERNS

- a18. Hyunseo Son, Biomedical Engineering, Jeonbuk University, Jan 2025-Feb 2025
a17. Su Yeong Park, Mechanical Engineering, Kookmin University, Jan 2025-Feb 2025
a16. Jehyun Park, Mechanical Engineering, Kookmin University, Dec 2024-Feb 2025
a15. Yongseung Yang, Mechanical Engineering, Kyunghee University, June 2024-Aug 2024
a14. Young Sang Hwang, Smart ICT Convergence, Konkuk University, Jul 2024-Aug 2024
a13. Seung Geon Yoo, Mechanical Engineering, Korea Aerospace University, Jan 2024-Feb 2024
a12. Hyeon Cho, Mechanical Engineering, Kumoh National Institute of Technology, June 2021-Aug 2022
a11. Heonsu Kim, 3D Printable Prosthetic Foot, Hanyang University, Seoul, Korea via global human resource development program for innovative design in robot and engineering, The ministry of trade industry and energy, Korea, Feb 2020-Aug 2020
a10. Huijin Um, Toe Joint Consideration for the Prosthetic Foot, Hanyang University, Korea via global human resource development program for innovative design in robot and engineering, The ministry of trade industry and energy, Korea, Sep 2019-Feb 2020
a9. Seref Yagli, Rehabilitation Robotics, Harmony Science Academy High School, Houston, TX, Research Experiences for Teachers **(RET)** in Mechatronics, Robotics, and Automated System Design, NSF, SU2017
a8. Iván Nicolás Gutiérrez Arias, Biomechanical evaluation of assistive glove design for stroke rehabilitation, Pontificia Universidad Católica de Chile (PUC), SP2017
a7. Stephanie O'Donoghue, Control of series elastic actuators for robot compliance, Chattahoochee Technical College, Acworth, GA, Research Experiences for Teachers **(RET)** in Mechatronics, Robotics, and Automated System Design, NSF, SU2016
a6. Sam Nadell, Development of series elastic actuators for robot compliance, Washington University in St. Louis, St. Louis, MO, Research Experiences for Undergraduates **(REU)** in Mechatronics, Robotics, and Automated System Design, NSF, SU2016
a5. Jose Guillermo Colli Alfaro, Development of virtual rehabilitation environment for stroke patients, Model University, Mexico, **CANIETI** Program (A program for engineering and intensive English Internship to increase the number of Mexican students in graduate programs in the US), SU2016
a4. Cosme Jose Basto Adrian, Development of virtual rehabilitation environment for stroke patients, Superior Tech Institute of Motul, Mexico, **CANIETI** Program, SU2015
a3. Abril Elvira Medina Moreno, Development of virtual rehabilitation environment for stroke patients, Autonomous University of Yucatan, Mexico, **CANIETI** Program, SU2015
a2. Junior Jose Garcia Sosa, Development of virtual rehabilitation environment for stroke patients, Model University, Mexico, **CANIETI** Program, SU2015
a1. Manuel Jurado Ledon, Development of virtual rehabilitation environment for stroke patients, Model University, Mexico, **CANIETI** Program, SU2015

Thesis Committee

PH.D. DEGREE

- a29. Taehoon Jung (ME, GIST, Jaewook Lee) - Design of Halbach Array In-wheel Motor using Multi-Material Topology Optimization, Defended on Nov 2024
a28. Nam-Jin Park (ME, GIST, Hyosung Ahn) - Controllability and Controllable Subspaces of Structured Networks: A Graph-Theoretical Approach, Defended on May 2024
a27. Donghyun Song (BioE, UNIST, Gwanseob Shin) - Continuous Knee Joint Torque/Angle Prediction from Surface Electromyography during Stair Ambulation: Validation and Application for Assistive Devices, Defended on Dec 2023
a26. Younghun John (ME, GIST, Hyosung Ahn) - Consensus of Multi-agent Systems: Fixed-time Convergence and H^∞ Performance, Defended on Nov 2021
a25. Jeonggeun Lim (ME, GIST, Jongho Lee) - Obstacle Magnification for Obstacle Avoidance and Safe Landing Site Detection using Slope Estimation and Semantic Segmentation for a multi-rotor, Defended on Nov 2021
a24. Woolim Hong (MEEN, Pilwon Hur) - User- and speed-adaptability enhancement of user gait phase estimation for robotic transfemoral prosthesis control, Defended on Nov 2021
a23. Shawanee Patrick (MEEN, Pilwon Hur) - Improving the design metrics of walking assistive devices, Defended on Oct 2021

- a22. Namita Anil Kumar (MEEN, Pilwon Hur) - Towards better user customization of lower-limb assistive devices: data driven control strategies and a self-aligning knee mechanism, Defended on Oct 2021
- a21. Kwon, Seong-Ho (ME, GIST, Hyo-Sung Ahn) - Multi-agent systems: Rigidity based formation control and group consensus, Prelim on May 2021
- a20. Quoc Van Tran (ME, GIST, Hyo-Sung Ahn) - Direction-only Distributed Formation Control and Pose Localization in Multi-Agent Systems, Defended on April 2021
- a19. Christian DeBuys (MEEN, Pilwon Hur) - Control of lower limb exoskeleton for paraplegic patients, Prelim on Aug 2021
- a18. Jon Paul Elizondo (MEEN, Harry Hogan) - Jumping Exercise and Sclerostin Antibody as Countermeasures for Simulated Microgravity in the Adult Rat Skeleton, Defended on March 2021
- a17. Muaho Chen (AERO, Robert E. Skelton) - Soft Robotics by Integrating Structure, Materials, Fluids, Control Design, and Signal Processing using the Tensegrity Paradigm, Defended on March 2021
- a16. Moein Nazifi (MEEN, Pilwon Hur) - Muscle Synergy for Slip Rehabilitation, Defended on Jun 2020
- a15. Chong Ke (ETID, Xingyong Song) - Dynamic modeling and optimization of downhole drilling, Defended on May 2020
- a14. Humberto Ramos (AERO, John Hurtado) - Control of flight dynamics, Defended on May 2020
- a13. Chi-Wei Kuo (MEEN, Chii-Der Suh) - Controlling bifurcation and dynamic behavior in vibro-impact systems, Defended on Jun 2019
- a12. Shao-Chen Hsu (AERO, Raktim Bhattacharya) - Modeling and Control of Mobile Robots Based on Tensegrity Structures, Defended on Jun 2019
- a11. Kaimi Gao (MEEN, Bryan Rasmussen) - Dynamic modeling and control architecture design for multi-evaporator pumped two-phase system, Defended on May 2019
- a10. Rana Soltani (MEEN, Reza Langari) - Development and control of an active upper limb exoskeleton for rehabilitation, Defended on Jan 2019
- a9. Amin Zeiaee (MEEN, Reza Langari) - Development of an upper limb rehabilitation exoskeleton for time-independent co-ordination training, Defended on Jan 2019
- a8. Yitsen Pan (MEEN, Pilwon Hur) - Gait and Balance Rehabilitation with Skin Stretch Feedback, Defended on Dec 2018
- a7. Kenneth Chao (MEEN, Pilwon Hur) - Bipedal walking analysis, control and applications towards human-like behavior, Defended on Dec 2018
- a6. Serdar Coskun (MEEN, Reza Langari) - Stochastic Decision Making and Advanced-Control Design for an Emergency Lane Change Assistance System in Highway Driving, Defended on Jul 2018
- a5. Jaewook Yoo (CSEN, Yoonseok Choe) - Sensorimotor Aspects of Brain Function: Development, Internal Dynamics, and Tool Use, Defended on Feb 2018
- a4. Bo Peng (MEEN, Sheng-Jen Hsieh, Pilwon Hur (Co-Chair)) - Modeling and prediction of personalized thermal comfort and control of HVAC system for indoor climate, Prelim on Oct 2017
- a3. Ivan De Jesus Diaz Rodriguez (ECEN, Shankar Bhattacharyya) - Modern design of classical controller, Defended on Feb 2017
- a2. Sitae Kim (MEEN, Alan Palazzolo) - Multiple steady state responses prediction for nonlinear rotordynamic systems, Defended on Oct 2016
- a1. Chun Lin Yang (MEEN, Chii-Der Suh) - Characterization and Control of Real-World Complex Networks, Planned

M.S. DEGREE

- a34. Hyun Cho (ME, GIST, Pilwon Hur) - Effects of Walking Speed and Visual Stimulus on the Axis Orientation of the Metatarsophalangeal Joint and Foot Progression Angle During Gait, Defended on Dec 2024
- a33. Minji Kim (ME, GIST, Kyunghwan Choi) - Impedance Control of Robot Manipulators Without Relying on External Force Information, Defended on Dec 2024
- a32. Myeongseok Ryu (ME, GIST, Kyunghwan Choi) - Constrained Optimization-Based Neuro-Adaptive Control (CoNAC) for Euler-Lagrange Systems, Defended on Dec 2024
- a31. Jongwon Lee (ME, GIST, Hyosung Ahn) - Control of Airship using Nonlinear MPC and Nonlinear Disturbance Observer, Defended on Dec 2024
- a30. Muhammad Umair (ME, GIST, Kyihwan Park) - Hybrid MPC-PI Control for Enhancing Imaging Speed of Non-contact Atomic Force Microscopy, Defended on June 2024
- a29. Seunghun Jang (ME, GIST, Kyunghwan Choi) - Online Stator Flux Linkage Estimation of Synchronous Machines, Defended on June 2024
- a28. Jiyoung Jeong (ME, GIST, Pilwon Hur) - Environmental perception and joint trajectory generation for transfemoral pros-

thesis, Defended on June 2024

- a27. Gwonyeol Lee (ME, GIST, Seongim Choi) - Adaptive Sampling and Machine learning methods for Efficient Meta-model and application to Real-Time Target Tracking, Defended on Dec 2023
- a26. Hyungseok Ryu (ME, GIST, Pilwon Hur) - Estimation of Gait Asymmetry and Gait Speed: Focusing on the Affected Side, Defended on Dec 2023
- a25. MyeongJu Cha (ME, GIST, Pilwon Hur) - A Phase Variable Based Phase Estimation for Stair Descent, Defended on Dec 2023
- a24. Sunwoong Moon (ME, GIST, Pilwon Hur) - aDMP Based Speed Dependent Gait Pattern Adaptive Phase Variable Estimation, Defended on Dec 2023
- a23. Kwonseung Cho (ME, GIST, Pilwon Hur) - Effect of The Toe Joint on Bipedal Walking, Defended on June 2023
- a22. Myeonggyun Kim (ME, GIST, Jongho Lee) - Autonomous pursuit unmanned flight system based on location information of a launch-attached location tracker and stereo vision, Defended on June 2023
- a21. Joon Oh Kim (ME, GIST, Yong-Gu Lee) - Development and Implementation of Visual Odometry for Autonomous Vehicles, Defended on May 2023
- a20. Jaejun Jang (ME, GIST, Seongim Choi) - Data-Driven Real-Time Urban Air Mobility(UAM) Operation Research, Defended on Dec 2022
- a19. Kukhee Lee (ME, GIST, Hyunseok Oh) - A Study on Anomaly Detection Using Normalized Autoencoder for the Rotating Machines, Defended on Dec 2021
- a18. Yongseok Seo (ME, GIST, Hyunseok Oh) - A Study on Anomaly Detection Using Normalized Autoencoder for the Rotating Machines, Defended on Dec 2021
- a17. Veronica Knisley (MEEN, Pilwon Hur) - Numerical methods for trajectory optimization and control of bipedal walking, Defended on March 2020
- a16. Yonghee Lee (MEEN, Pilwon Hur) - Exploring how functional improvement is related to interaction between children with cerebral palsy and horses during hippotherapy: a pilot study, Defended on Oct 2019
- a15. Kenny Chour (MEEN, Pilwon Hur) - Development of an electrotactile haptic device with application to balance rehabilitation, Defended on Mar 2018
- a14. Yalun Wen (MEEN, Prabhakar Pagilla) - Robotic surface finishing of curved surfaces: real-time identification of surface profile and control, Defended on Mar 2018
- a13. Aritra Biswas (ASEN, Raktim Bhattacharya) - Dynamics and control of a planar tensegrity robot arm, Oct 2017
- a12. Woolim Hong (ECEN, Pilwon Hur, Shankar Bhattacharyya) - Control of powered transfemoral prosthesis, Defended on Oct 2017
- a11. Namita Anil Kumar (MEEN, Pilwon Hur) - Hand Rehabilitation Device using Gyroscopic Effects, Defended on Jun 2017
- a10. Aditya Vighnesh (ECEN, Aydin Karsilayan) - Analog to Digital converters, Defended on Apr 2017
- a9. Daniel McGowan (MEEN, Pilwon Hur) - Design of Hybrid Powered Transfemoral Prosthesis, Defended on Mar 2017
- a8. Jacob D. Southern (MEEN, Chii-Der Suh) - High speed spindle design using radial and axial active magnetic bearings, Defended on Mar 2017
- a7. Achu G Byju (BMEN, Michael Madigan) - Development of balance recovery training device and biomechanical measures for tripping risk, Defended on Opt 2016
- a6. Shawanee Patrick (MEEN, Pilwon Hur) - Biomechanical analysis of lower limb powered prosthesis, Defended on Jun 2016
- a5. Victor Paredes (MEEN, Pilwon Hur) - Upslope walking with transfemoral prosthesis using optimization based spline generation, Defended on Mar 2016
- a4. Aakar Mehra (MEEN, Aaron Ames) - Analysis of various adaptive cruise controller via experimental implementation, Defended on Jun 2015
- a3. Felipe Constantin Reyes Miftajov (MEEN, Pilwon Hur) - Robotic Grinding, Planned
- a2. Veronica Knisley (MEEN, Pilwon Hur) - Control of bipedal walking under slipping condition, Planned
- a1. Yuan Wei (MEEN, Won-jong Kim) - Control of a motor based on Halbach array, Planned

Service Activities

Gwangju Institute of Science and Technology

DEPARTMENTAL

- Search Committee: SP2021, FA2021, SP2022, FA2022, SP2023, SP2024, FA2024

- Robotics Club Activities Revitalization Task Force: SP2022, FA2022, SP2023
- Curriculum Committee: SP2024, FA2024
- Strategic Development Committee: SP2024, FA2024
- Liaison for the Sangmu Army Infantry School, 2024 - Current
- MRE Day Prep Committee (invited Youtuber “Yak”), 2024
- Academia-Industry Committee Between GIST and LG, 2022 - 2024
- Steering Committee for LG Contract-Based Department, 2024

COLLEGE & UNIVERSITY

- Appointment as Special Ambassador for Science and Technology (Jangseong County), 2024 - Current
- Director of Intelligent Motor Talent Training Center, 2023 - Current
- International Undergraduate Student Admission Committee, 2021
- Domestic Undergraduate Student Admission Committee, 2021 - Current
- Faculty Advisor for University House, 2022 - Current
- University Residential Operations Committee, 2022 - Current
- Faculty Senate, 2022 - 2023
- Operating Committee for the Food Tech Robotics in Jangseong County, 2024
- Motor Boot Camp, SU2004

STUDENT ORGANIZATION

- Advisor for ISAAC (Robotics Club), 2022 - Current

Texas A&M University

DEPARTMENTAL

- Seminar Committee for MEEN 681: FA2014, SP2015, FA2015, SP2016, FA2016, SP2017, FA2017, SP2018
- Qualifier Committee for Control: SP2016 (Alternate member for control area), FA2016 (Member for control area), SP2017 (Chair for control area)
- Distance Learning Committee: FA2016, SP2017, FA2017, SP2018, FA2018, SP2019

COLLEGE & UNIVERSITY

- Committee, Curriculum Development for Equine-Assisted Activities and Therapies, Texas A&M Equine Initiative, April 2019 - Present
- First Generation Engineering (FGE) Student Mentor, July 2017 - Present
- Engineering & Medicine (EnMed) Thematic Research Subcommittee and Instructor, Oct 2016 - Present
- Explorations Article Reviewer for 2016, 2018
- PESCA Reviewer for 2017, 2018

STUDENT ORGANIZATION

- Advisor for Texas A&M University Robotics Team and Leadership Experience (TURTLE), Jan 2015 - Present
- Advisor for Korean-American Scientists and Engineers Association (KSEA), Aug 2017 - Present

Conferences

ASSOCIATE EDITOR

- IEEE International Workshop on Advanced Robotics (ARSO) and its Social Impacts, Since 2017
- IEEE International Conference on Ubiquitous Robotics (UR), Since 2018
- RAS/EMBS IEEE International Conference on Biomedical Robotics and Biomechanics (BioRob), Since 2020
- IEEE/RSJ International Conference on Robotics and Automation (ICRA), Since 2021

REVIEWERS

- World Congress on Biomechanics (WCB)
- American Society of Biomechanics (ASB)

- International Conference on Biomedical Engineering and Biotechnology
- American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress & Exposition (IMECE)
- ASME Summer Biomechanics, Bioengineering and Biotransport Conference
- ASME International Design Engineering Technical Conferences (IDETC)
- IEEE Haptics Conference
- IEEE Conference on Control Technology and Applications (CCTA)
- IEEE Biomedical Robotics and Biomechatronics
- IEEE Control Systems Society Conference
- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE International Conference on Robotics and Automation (ICRA)
- Dynamic Systems and Control Conference (DSCC)
- American Control Conference (ACC)
- Eurohaptics

COMMITTEE

- ICROS Board Member, 2024 - 2025
- KSME Bioengineering Division Board Member, 2024 - Current
- KSME IT/Convergence Division Board Member, 2022 - Current
- ICROS Elected Council Member, 2023 - 2024
- Vice Chair of International Program Committee for IFAC World Congress 2026
- Program Chair for Institute of Control Robotics and Systems (ICROS) 2026
- Program Committee for ICROS 2025
- Program Committee for ICROS 2024
- Program Committee for ICROS 2023
- Program Committee for ICROS 2021
- IROS, Humanoid and Bipedal Locomotion II Session Chair, 2019
- US-KOREA Conference on Science, Technology and Entrepreneurship (UKC), Robotics and Controls Session Chair, 2018
- IROS, Optimization Session Chair, 2017
- American Society of Biomechanics (ASB), Balance and Sensory Augmentation Session Chair, 2015
- ASB, Falls Session Chair, 2012

Journal

ASSOCIATE EDITOR

- International Journal of Control, Automation, and Systems (IJCAS), Since 2018
- Frontiers in Human Neuroscience, Since 2021

REVIEWERS

- IEEE Access
- IEEE Control System Magazine
- IEEE Transactions on Human-Machine Systems
- IEEE Transactions on Haptics
- IEEE Transaction on Industrial Electronics
- IEEE Transaction on Neural Systems and Rehabilitation Engineering
- IEEE Robotics and Automation Letters
- IEEE/ASME Transactions on Mechatronics
- ASME Journal of Biomechanical Engineering
- Scientific Reports
- International Journal of Intelligent Robotics and Applications (JIRA)

- Journal of Translational Engineering in Health and Medicine
- Advances in Mechanical Engineering
- Journal of Biomechanics
- Journal of Applied Biomechanics
- Journal of Neurophysiology
- Neuropsychologia
- PLOS ONE
- Frontiers in Human Neuroscience
- CRC Press
- Clinical Biomechanics
- Gait and Posture
- Applied Ergonomics
- Annals of Biomedical Engineering
- Medical & Biological Engineering & Computing
- Journal of Engineering in Medicine
- Quality and Reliability Engineering International

Other Services

EXTERNAL GRANT REVIEWER

- NRF Doctoral Student Research Incentive Grant, Review Panelist, April 2024
- NRF ICT, Sejong Fellowship, Review Panelist, April 2024
- NRF Engineering, Sejong Fellowship, Review Panelist, April 2024
- External Expert Evaluator for the Korea Institute of Machinery and Materials (KIMM), Jan 12, 2024
- NRF Doctoral Student Research Incentive Grant, Review Panelist, July 2023
- NRF Mid-Career Award (Type 1-1), Review Panelist, July 2023
- NRF Basic Research Lab (Multidisciplinary), Review Panelist, April 2023
- NRF ICT, Basic Research, Review Panelist, April 2023
- NRF Regional University, Review Panelist, April 2023
- NRF Engineering, Basic Research, Review Panelist, April 2023
- Evaluator for Jeollanam-do Overseas Student Support Program, April 2023
- Evaluator for Jeollanam-do Overseas Student Support Program, April 2022
- NSF CPS, Review Panelist, June 2019
- NSF CPS, Review Panelist, May 2019
- National Institute of Standards and Technology (NIST) for the US-Israel Binational Industrial Research and Development (BIRD) Foundation, May 2019

EXTERNAL COMMITTEE

- The Warrior Platform at the Army Infantry School, Sangmu Military Academy, June 2024 - Current
- Future Business Planning Team, Gwangju Technopark, 2024
- American Society for Testing and Materials (ASTM) F48.02 Committee for standards on Exoskeletons and Exosuits for Industry, Medical and Military Services, Mar 2019 - Current

Professional Membership

- Institute of Control Robotics and Systems (ICROS)
- Institute of Electrical and Electronics Engineers (IEEE)
- American Control Conference (ACC)
- Wearable Robotics Association

- International Society for Virtual Rehabilitation
- American Heart Association (AHA)
- Society for Neuroscience (SfN)
- World Federation for NeuroRehabilitation
- World Congress on Biomechanics (WCB)
- Korean-American Scientist and Engineers Association (KSEA)
- American Society of Biomechanics (ASB)
- Korean Society of Simulation
- Korean Society of CAD/CAM

Media Coverage

- “The Gwangju Institute of Science and Technology Scientists Confirm Horse Riding as a Viable Mobility Treatment for Cerebral Palsy” *Yahoo Finance*, Oct 29th, 2021
<https://finance.yahoo.com/news/gwangju-institute-science-technology-scientists-123300432.html>
- “LIGHTER ROBOTIC TRANSFEMORAL PROSTHESIS DEVELOPED” *The O&P Edge Magazine*, Feb 28th, 2019
<https://opedge.com/Articles/ViewArticle/2019-02-28/lighter-robotic-transfemoral-prosthesis-developed>
- “Texas A&M researcher develops lighter robotic prosthesis for amputee patients” *Texas A&M Engineering Experiment Station (TEES)*, Jan 29th, 2019
<https://tees.tamu.edu/news/2019/01/29/texas-am-researcher-develops-lighter-robotic-prosthesis-for-amputee-patients/>
- “Invitation for International Seminar of Biomedical Engineering” *Universidad de los Andes*, June 5th, 2018
<https://ingbiomedica.uniandes.edu.co/index.php/es/menu-dpto-news/9-uncategorised/365-cubrimiento-especial-2>
- “Researchers developing robotic prosthetics to restore balance” *The O&P Edge Magazine*, May 11th, 2017
<https://opedge.com/Articles/ViewArticle/2017-05-11/researchers-developing-robotic-prostheses-to-restore-balance>
- “Researchers developing robotic prosthetics to help restore balance in fall victims” *Texas A&M Engineering*, May 8th, 2017
<https://engineering.tamu.edu/news/2017/05/researchers-developing-robotic-prosthetics-to-help-restore-balance-in-fall-victims.html>
- “Engineering partnership touches lives of students, seniors” *University of Wisconsin-Milwaukee*, March 13th, 2014
<https://uwm.edu/news/engineering-partnership-touches-lives-of-students-seniors/>

Honors & Awards

- Education Innovation Award, GIST, 2022
- MEEN Research Priming Seed Grant Award, TAMU, 2019
- MEEN Faculty Development Funding, TAMU, 2019
- Horses and Humans Research Foundation Research Award for 2017
- Travel Award, International Conference on Virtual Rehabilitation, 2013
- American Heart Association Postdoc Fellowship, 2012
- Travel Award, World Congress on Biomechanics, 2010
- Paul D. Doolen Scholarship on Aging, Nominated as alternate winner, 2009, 2010
- Graduate Travel Award, UIUC, 2007
- Schaller Travel Award, UIUC, 2007
- National Scholarship, Ministry of Science and Technology, Korea, 2004-2006
- Summa Cum Laude, Mechanical Engineering, Hanyang University, Seoul, Korea, 2004
- Merit-based Scholarship, Hanyang University, Seoul, Korea

Honors & Awards (Students)

- Sunghwan Bae, Best BS Thesis Award, MRE, GIST, Feb 2025
- Haewon An, Best BS Thesis Award, MRE, GIST, Aug 2024
- Myeongju Cha, Best Paper Award, ICROS, 2024
- Kwonseung Cho, Best Paper Award, KASB, 2023
- Seungyun Lee, Best BS Thesis Award, ME, GIST, Feb 2023
- Sungwoong Moon, Best Paper Award, KASB, 2022
- Juyeong Hong, Best BS Thesis Award, ME, GIST, Aug 2022
- Sungwoong Moon, Best BS Thesis Award, ME, GIST, Feb 2022
- Christian DeBuys, Best Paper Award, SCASB, 2019
- Namita Anil Kumar, Graduate Student Teaching Award, TAMU, 2019
- Moein Nazifi, Teaching Fellow, TAMU, 2019
- Shawanee Patrick, NSF AGEP Texas A&M Research Model Scholarship, 2018
- Moein Nazifi, ASB Travel Grant, 2018
- Yitsen Pan, NATEA-Dallas Scholarship, 2017
- Kenneth Chao, Mechanical Engineering Travel Grant, 2017
- Moein Nazifi, Mechanical Engineering Travel Grant, 2017
- Yitsen Pan, Mechanical Engineering Travel Grant, 2017
- Moein Nazifi, Best Paper Award, SCASB, 2017
- Moein Nazifi, Delsys Travel Grant, 2016
- Han Ul Yoon, TAMU Postdoc Travel Grant, 2016
- Han Ul Yoon, GenDepot Award, 2016
- Woolim Hong, GenDepot Award, 2016
- Moein Nazifi, Mechanical Engineering Travel Grant, 2016
- Shawanee Patrick, ASB Diversity Travel Award, 2016
- Moein Nazifi, Mechanical Engineering Travel Grant, 2015
- Yitsen Pan, Mechanical Engineering Travel Grant, 2015
- Kenneth Chao, Taiwan Government Scholarship for Outstanding Students to Pursue Graduate Study Abroad for 2 years, 2015
- Yitsen Pan, The Association of Chinese American Professionals (ACAP) Student Research Project Contest Finalist, Houston, TX, 2015
- Han Ul Yoon, GenDepot Award, 2014

Outreach & Extra Activities

- Lecture on Self-Designed Curriculum at Gwangju Science High School: Applied Mathematics II, Spring 2024
- Judging at the National Gifted Schools Joint R&E Excellence Presentation Conference, Jan 9, 2024
- Judging at the Advanced Independent Research Presentation Contest of Gwangju Science High School, Nov 28, 2023
- Lecture on Self-Designed Curriculum at Gwangju Science High School: Applied Mathematics I, Fall 2023
- Invited Lecture at Gwangju Science Museum's Science School: Interaction Between Humans and Robots, July 19, 2023
- Special Lecture at Suncheon Jeil High School: Physical Interaction Between Humans and Robots, July 5, 2023
- Lecture on Self-Designed Curriculum at Gwangju Science High School: Applied Mathematics II, Spring 2023
- Training for Mathematics Teacher at Gwangju Science High School: Mathematics Education Using Mathematica, Nov 16, 2022
- Lecture on Self-Designed Curriculum at Gwangju Science High School: Applied Mathematics I, Fall 2022
- Special Lecture at POSCO High School in Incheon: Physical Interaction Between Humans and Robots, May 27, 2022
- Outreach for Society of Women Engineers club, March, 2021, Hereford High School, Parkton, Maryland
- Organizing the Career Development Forum with 150 International Students, and Professionals from Academia and Industry, Sponsored by Korean Government, KSEA, and Houston Consulate, Nov, 3rd, 2018, Texas A&M University

- Organizing 12 TAMU-KSEA Seminars since Fall 2017 on the following Topics: Career Developments for Academia and Industry, Resume Writing, Career Fair Preparation, Successful Life for Undergraduate and Graduate Students, Issues in VISA and Green Card, Field Trip to Companies in Houston
- K-12 Outreach: Discovery Night at Rock Prairie Elementary
- Faculty Mentor for Korean-American Scientist and Engineers Association (KSEA) at TAMU
- Faculty Mentor for First Generation Engineering Students at TAMU (FGE)
- Helping establish a robotics program in the Department of Electrical and Computer Engineering Technology at Chattahoochee Technical College, Acworth, GA
- Advising a student organization “Texas A&M University Robotics Team and Leadership Experience (TURTLE)”
- Faculty Mentor for Louis Stokes Alliance for Minority Participation (LSAMP) Bridge to Doctorate Program (BTD)
- Robotics club at Deer Creek Intermediate School in Winconsin
- (Ordained) Deacon, Korean Church at Champaign-Urbana
- Web masters for several organizations
- Development of library information system for Korean Language School in Champaign
- Development of Election System for a Korean Church
- Flutist, Piano Accompanist at Korean Churches
- Active runner and cyclist