PilwonHur

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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-Wecksler
- 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 Kown, Jung Kim

Hanyang University *Seoul, Korea*

B.S. Mechanical Engineering *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 *Busan, Korea*

High School Diploma *Mar 1995 - Feb 1998*

- Concentration on Mathematics and Science
- Summa Cum Laude

Publication

Journal Papers (Under Review and In Prep)

j5. Wiha Choi, Hayoon Lee, **Pilwon Hur**, Young-Kwan Kim, Junghoon Lee, and Sehoon Oh, "Real-time Methodology for Estimating Muscle Force of Upper Limb during Isokinetic Single-Joint Exercises using Gaussian Process Regression," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, Under review

j4. 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

j3. 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

j2. Veronica Knisley, Kwonseung Cho, and **Pilwon Hur**, "Preferred Jacobian Differentiation and Direct Collocation Methods for an Efficient and Accurate Bipedal Walking Gait," In Preparation

j1. Han Ul Yoon, and **Pilwon Hur**, "Effect of customized haptic feedback on navigation characteristics and performance," In Preparation

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, Mojitaba 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

c99. 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

c98. 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

c97. 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

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 Terrainusing 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 GaitsFound 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**, Hangue 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 Polynimials 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 temporospatial 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 snergy 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. Mojitaba 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, Philadephia, 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-Tettey 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

i69. "Free Energy Principle: A Unifying Framework for Ation, 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, Daegue, 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*, UTHealth 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*, Daejon, 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*

- Refer to Texas A&M University

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

Korean Advanced Institute of Science and Technology *Daejeon, Korea*

Research Assistant *Sep 2004 - Aug 2006*

- 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

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 *Gwangju, Korea*

Associate Professor *Dec 2021 - PRESENT*

t4. MC2103: Dynamics - FA2021, FA2022, FA2023

t3. MC3215: Mechanical Signals and Systems - SP2021, SP2022, SP2023

t2. ME5160: Advanced Dynamics - SP2023

t1. ME5166: Intelligent Motor Integration Project - FA2023

Texas A&M University *College Station, TX*

Assistant Professor *Aug 2014 - Dec 2021*

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 Opereting 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 *Urbana, IL*

Instructor/Teaching Assistant *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

a12. Jinsik Ju - Control for safety in cyclotron, Expected to graduate in Feb 2027

a11. Kwonseung Cho - Control of lower limb exoskeleton, Expected to graduate in Feb 2027

a10. Jiyoon 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-alignming 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

a18. Moonyoung Yim, GIST, Expected to graduate in Aug 2025
a17. Sunghyun Kim, GIST, Expected to graduate in Feb 2025
a16. Hyewon Park, GIST, Expected to graduate in Feb 2025
a15. Hyeon Cho, GIST, Expected to graduate in Aug 2024
a14. Jiyoung Jeong, GIST, Expected to graduate in Feb 2024
a13. Hyung-Seok Ryu, GIST, Expected to graduate in Feb 2024
a12. Myeongju Cha, GIST, Expected to graduate in Feb 2024
a11. Sunwoong Moon, GIST, Expected to graduate in Feb 2024
a10. Kwonseung Cho, GIST, **Graduated in Aug 2023**
a9. Felipe Constantin 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

a30. Leaheon Kim - GIST, Jan 2023 - Current
a29. Wooyoung Park - GIST, Sep 2022 - Current
a28. Sunghwan Bae - GIST, Sep 2022 - Current
a27. Haewon An - GIST, Jan 2022 - Current
a26. Hyeonwoo Lee - GIST, Jan 2022 - Current
a25. Junhyeok Im - GIST, Sep 2021 - Current
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

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

a24. Kwon, Seong-Ho (ME, GIST, Hyo-Sung Ahn) - Multi-agent systems: Rigidity based formation control and group consensus, Prelim on May 2021

a23. Quoc Van Tran (ME, GIST, Hyo-Sung Ahn) - Direction-only Distributed Formation Control and Pose Localization in Multi-Agent Systems, Defended on April 2021

a22. Christian DeBuys (MEEN, Pilwon Hur) - Control of lower limb exoskeleton for paraplegic patients, Prelim on Aug 2021

a21. 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

a20. 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

a19. Moein Nazifi (MEEN, Pilwon Hur) - Muscle Synergy for Slip Rehabilitation, Defended on Jun 2020

a18. Chong Ke (ETID, Xingyong Song) - Dynamic modeling and optimization of downhole drilling, Defended on May 2020

a17. Humberto Ramos (AERO, John Hurtado) - Control of flight dynamics, Defended on May 2020

a16. Woolim Hong (MEEN, Pilwon Hur) - Unifying walking control of transfemoral prosthesis for various slopes, Prelim on Jan 2020

a15. Chi-Wei Kuo (MEEN, Chii-Der Suh) - Controlling bifurcation and dynamic behavior in vibro-impact systems, Defended on Jun 2019

a14. Shao-Chen Hsu (AERO, Raktim Bhattacharya) - Modeling and Control of Mobile Robots Based on Tensegrity Structures, Defended on Jun 2019

a13. Kaimi Gao (MEEN, Bryan Rasmussen) - Dynamic modeling and control architecture design for multi-evaporator pumped two-phase system, Defended on May 2019

a12. Namita Anil Kumar (MEEN, Pilwon Hur) - Design of lower limb exoskeleton for paraplegic patients, Prelim on May 2019

a11. Rana Soltani (MEEN, Reza Langari) - Development and control of an active upper limb exoskeleton for rehabilitation, Defended on Jan 2019

a10. Amin Zeiaee (MEEN, Reza Langari) - Development of an upper limb rehabilitation exoskeleton for time-independent co-ordination training, Defended on Jan 2019

a9. Yitsen Pan (MEEN, Pilwon Hur) - Gait and Balance Rehabilitation with Skin Stretch Feedback, Defended on Dec 2018

a8. Kenneth Chao (MEEN, Pilwon Hur) - Bipedal walking analysis, control and applications towards human-like behavior, Defended on Dec 2018

a7. 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

a6. Jaewook Yoo (CSEN, Yoonseok Choe) - Sensorimotor Aspects of Brain Function: Development, Internal Dynamics, and Tool Use, Defended on Feb 2018

a5. Shawanee Patrick (MEEN, Pilwon Hur) - Biomechanics as a consideration in design mobility of assistive devices, Prelim on May 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 Rodriguesz (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

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

College & University

- International Undergraduate Student Admission Committee, 2021
- Domestic Undergraduate Student Admission Committee, 2021, 2022, 2023
- Undergraduate Residence Advising Committee, 2022, 2023
- Faculty Senate, 2022, 2023

Student Organization

- Issac (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 (FGEn) 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 Biomechatronics (BioRob), Since 2020
- IEEE/RSJ International Conference on Robotics and Automation (ICRA), Since 2021
- Program Committee for Institute of Control Robotics and Systems (ICROS), 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

Chairs

- IROS, Humanoid and Bipedal Locomotion II Session, 2019
- US-KOREA Conference on Science, Technology and Entrepreneurship (UKC), Robotics and Controls Session, 2018
- IROS, Optimization Session, 2017
- American Society of Biomechanics (ASB), Balance and Sensory Augmentation Session, 2015
- ASB, Falls Session, 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

- 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

- American Society for Testing and Materials (ASTM) F48.02 Committee for standards on Exoskeletons and Exosuits for Industry, Medical and Military Services, Mar 2019 - Present

Professional Membership

- 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

- 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 Schoarship, 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)

- 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

- 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 (FGEn)
- 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