

CURRICULUM VITAE

JEONGHEE KIM, PHD

Quantitative Neuro Rehabilitation Lab

Engineering Technology and Industrial Distribution | Texas A&M University

106 Ross Street | Fermier Hall 008A | College Station, TX 77843-3367

Email: jeonghee.kim@tamu.edu | Office: (979) 845-1459 | Mobile: (214) 938-6944 | Webpage: www.jh-kim.org

RESEARCH INTERESTS

- Signal processing and machine learning for biomedical applications
- Brain-Tongue Computer Interface, Human-computer and human-robot interactions
- Neuro-electronic system with closed-loop optimization
- Wearable embedded and smart mobile system for biomedical applications
- Cyber-physical system for applications of medical devices, assistive technology, and rehabilitation
- Modeling nervous system and human behaviors of neurological disorders and physical disabilities
- Experimental design for quantitative assessment and biomedical studies

ACADEMIC APPOINTMENT

Assistant Professor and Corrie and Jim Furber '64 Faculty Fellow

Engineering Technology and Industrial Distribution

Electrical and Computer Engineering (Courtesy Appointment)

Texas A&M University, College Station, Texas

September 2018-Present

June 2020-Present

EDUCATION

Doctor of Philosophy, Electrical and Computer Engineering

Georgia Institute of Technology, Atlanta, Georgia

Advisor: Dr. Stephen P. DeWeerth, Co-Advisor: Dr. Omer T. Inan

May 2018

Master of Science, Electrical Engineering: System

University of Michigan, Ann Arbor, Michigan

Advisor: Dr. Kathleen Sienko

December 2009

Bachelor of Science, Electrical Engineering (Dual-Degree), Magna cum Laude

University of Texas at Dallas, Richardson, Texas

Advisor: Dr. John H.L Hansen

May 2008

Bachelor of Science, Electrical Engineering and Computer Science (Dual-Degree)

Kyungpook National University, Daegu, South Korea

August 2007

HONORS & AWARDS

- **Best Oral-presentation award**, International Symposium on Information Technology and Application, Feb 2022.
- **ETID Departmental Research Excellence Award**, Dec. 2021.
- **Korean-American Women in Science and Engineering (KWise) Texas Chapter, 2021 Outstanding Member Award**, Nov. 2021.

- Appointment to the **Corrie and Jim Furber '64 Faculty Fellowship** (1/1/2021-12/31/2021) ETID, Texas A&M University
- TAMU One-time **Merit Payment**, Texas A&M University (2020, 2021).
- **Outstanding Research Award** for Predoctoral Student, Association of Korean Neuroscientists (AKN), *San Diego, CA*, Nov. 2016.
- **NSF Young Professional Award** at EMBC 2016, *Orlando, FL*, Aug. 2016 (\$500).
- **Poster Competition Awards** from Office of Executive Vice President for Research at Career, Research, Innovation and Development Conference 2016 (CRIDC), Georgia Tech, *Atlanta, GA*, Mar. 2016 (\$1,500).
- **Honorable mention** in 20th Samsung HumanTech Paper Award, Samsung Electronics, Feb. 2014.
- **Best Demonstration Award** in IEEE Biomedical Circuits and Systems Conference, *Taiwan*, Nov. 2012.
- **Finalist**, Inside-Edge Paper Award, Samsung Electro-mechanics, Aug. 2011
- **Da Vinci Awards Finalist**, National MS Society, Michigan Chapter, 2010.
- **The LEO Award** in the Prosthetics/Orthotics/Controls category, National MS Society, Michigan Chapter, 2010.
- **Barrier Breaker Award**, 12th Annual Galaxy of Stars, The Tommy Nobis Center, 2010.
- **Senior Design project award (3rd place)**, Department of Electrical Engineering, University of Texas at Dallas, 2007, 2008.
- **Korean Honor Scholarship**, The Embassy of the Republic of Korea, 2007.
- **The University of Texas at Dallas Academic Excellence Transfer Scholarship**, 2006-2008.
- **Jonsson School Scholarship**, University of Texas at Dallas, 2006-2008.
- **Dean's List**, University of Texas at Dallas, 2006-2008.
- **National Scholarship** for natural science and engineering student, Ministry of Education and Human Resources Development, Republic of Korea, 2003-2006.
- **Brain Korea 21 Academic Excellence Scholarship**, 2003.

PUBLICATIONS



Google Citations: 949; h-index: 15; i10-index18

Book Chapters

1. P. Angkititrakul, J.H.L. Hansen, S. Choi, T. Creek, J. Hayes, **J. Kim**, D. Kwak, L.T. Noecker, and A. Phan, (2009) "UTDrive: The smart vehicle project," In *In-Vehicle Corpus and Signal Processing for Driver Behavior* (Ch. 5., pp. 55-67). Springer US.

Journal Papers

In-preparation:

1. B. Jiang, H. Park, and **J. Kim**^{*}, "Efficacy of the Tongue-based discrete commands on Steering law tasks," will be submitted in *iScience*.
2. B. Jiang, H. Park, and **J. Kim**^{*}, "Efficacy of the Virtual Reality Wheelchair Training System for the Tongue-based Assistive Technology," will be submitted in *IEEE Journal of Biomedical and Health Informatics*.
3. B. Jiang, H. Park, and **J. Kim**^{*}, "Steering Law based Assessment for Wheelchair Performance via Virtual Reality Environment of Tongue-controlled Assistive Technology," will be submitted in *npj Digital Medicine*.
4. B. Irava, K. Aichelmann, and **J. Kim**^{*}, "Tongue-controlled Low-cost Wearable Exoskeleton," will be submitted in *IEEE Access*.
5. C. Lopez, and **J. Kim**^{*}, "Real-time Magnetic Anomaly Detection System via Wireless Mobile System," will be submitted in *IEEE Transactions on Instrumentation and Measurement*.
6. B. Jiang, H. Park, and **J. Kim**^{*}, "MORA: A tongue-controlled assistive technology for wheelchair driving," will be submitted in *IEEE Transactions on Biomedical Engineering*.
7. B. Jiang, H. Park, **J. Kim**^{*}, "Information Transfer Rate of the Intro-oral Tactile Display," will be submitted in *International Journal of Oral Science (Impact factor: 6.344)*.

Under Review:

8. V. Srinivasan, R.H. Krishna, **J. Kim**, Y. Choe, H Park, "Proportional Distance-Based Electrotactile Feedback Improves Lateral Balance," under review in *Scientific Report*.

Published:

9. **J. Kim**^{*}, Y. Ham, H. Park^{*}, “Underground Metal Pipeline Localization Using Low-cost Wireless Magnetic Sensors Mounted on an Excavator,” Accepted (3/3/2022) and in press, *IEEE Transactions on Industrial Electronics* (Impact Factor: 8.236).
10. B. Jiang, **J. Kim**^{*}, and H. Park^{*}, “Palatal Electrotactile Display Outperforms Visual Display in Tongue Motor learning,” Accepted and in press, *IEEE Transactions on Neural Systems & Rehabilitation Engineering*.
11. **J. Kim**^{*}, T. Wichmann, Omer T. Inan, and S.P. DeWeerth, “Analyzing the Effects of Stimulation Parameters for Tremor Modulation via Peripheral-Nerve Electrical Stimulation,” in *Journal of Personalized Medicine*, vol. 12, no. 1, pp. 76, Jan. 2022 (Impact Factor: 4.95).
12. J. Lee, Y. Ham, H. Park, **J. Kim**, “Challenges, Tasks, and Opportunities in Teleoperation of Excavator towards Human-in-the-loop Construction Automation,” in-press in *Automation in Construction*, vol. 135, pp. 104119, Mar. 2022 (online version: Jan. 2022; Impact Factor: 7.7).
13. **J. Kim**, D. Knox, H. Park^{*}, “Forehead Phantom Sensation is Augmented by the Perceived Risk and Increases Tactile Sensitivity,” *Sensors*, vol. 21, no. 24, p.824, Dec. 2021.
14. **J. Kim**^{*}, T. Wichmann, Omer T. Inan, and S.P. DeWeerth, “Fitts’ Law-Based Performance Metrics to Quantify Tremor in Individuals with Essential Tremor,” in *IEEE Journal of Biomedical and Health Informatics*, Dec. 2021 (Impact Factor: 5.223).
15. L. Barreto, A. Shon, D. Knox, H. Song, H. Park, **J. Kim**^{*}, “Motorized Treadmill and Optical Recording System for Gait Analysis of Grasshoppers,” *Sensors*, vol. 21, no. 17, Sep. 2021 (Highly Accessed Article).
16. B. Jiang, **J. Kim**^{*}, and H. Park^{*}, “A New Approach of Minimizing Midas Touch Problem for a Tracer-Free Tongue-Controlled Assistive Technology,” *IEEE Sensors Journal*, Vol. 21, no. 1, pp.743-754, Aug. 2020.
17. **J. Kim**^{*}, T. Wichmann, Omer T. Inan, and S.P. DeWeerth, “A Wearable System for Attenuating Essential Tremor Based on Peripheral Nerve Stimulation,” *IEEE Journal of Translational Engineering in Health and Medicine*, vol.8. no. 2000111, Apr. 2020.

Before joining Texas A&M University:

18. **J. Kim**, H. Park, J. Bruce, D. Rowles, J. Holbrook, B. Nardone, D. West, A. Laumann, E. Roth, and M. Ghovanloo, “Assessment of Tongue Drive Assistive Technology on Computers and Wheelchairs for People with Tetraplegia,” *IEEE Trans. on Neural Systems and Rehabilitation Engineering*, vol. 24, no. 1, pp 68-78, Jan. 2016 (featured article).
19. A. Laumann, J. Holbrook, J. Minocha, D. Rowles, B. Nardone, D. West, **J. Kim**, J. Bruce, E. Roth, and M. Ghovanloo, “Safety and efficacy of medically performed tongue piercing in people with tetraplegia for use with tongue-operated assistive technology,” *Topics in Spinal Cord Injury Rehab.*, vol. 21, no. 1, pp. 61-76, Jan. 2015.
20. **J. Kim**, H. Park, J. Bruce, D. Rowles, J. Holbrook, B. Nardone, D. West, A. Laumann, E. Roth, E. Veledar, and M. Ghovanloo, “Qualitative Assessment of Tongue Drive System by People with High-Level Spinal Cord Injuries,” *J. Rehabil. Res. Dev.*, vol. 51, no. 3, pp. 451-466, Jun. 2014.
21. **J. Kim**, H. Park, J. Bruce, E. Sutton, D. Rowles, D. Pucci, J. Holbrook, J. Minocha, B. Nardone, D. West, A. Laumann, E. Roth, M. Jones, E. Veledar, and M. Ghovanloo “The Tongue Enables Computer and Wheelchair Control for People with Spinal Cord Injury,” *Science Translational Medicine*, vol. 5, no. 213, p. 213ra166, Nov. 2013 (featured article; Impact Factor: 17.96).
22. X. Huo, H. Park, **J. Kim**, and M. Ghovanloo, “A Dual-Mode Human Computer Interface Combining Speech and Tongue Motion for People with Severe Disabilities,” *IEEE Trans. on Neural Systems and Rehabilitation engineering*, vol. 21, no. 6, pp.979-991, Nov. 2013.
23. M. Kothari, P. Svensson, J. Jensen, A. Kjærsgaard, **J. Kim**, J.F. Nielsen, M. Ghovanloo, and L. Baad-Hansen, “Training induced cortical plasticity compared between three tongue training paradigms,” *Neuroscience*, vol. 246, no. 29, pp. 1-12, Aug. 2013.
24. H. Park, M. Kiani, H. Lee, **J. Kim**, J. Block, B. Gosselin, and M. Ghovanloo, “A Wireless Magnetoresistive Sensing System for an Intraoral Tongue-Computer Interface,” *IEEE Trans. on Biomedical Circuits and Systems*, vol. 6, no. 6, pp. 571-585, Dec. 2012.
25. B. Yousefi, X. Huo, **J. Kim**, E. Veledar, and M. Ghovanloo, “Quantitative and Comparative Assessment of Learning in a Tongue-Operated Computer Input Device—Part II: Navigation Tasks,” *IEEE Trans. Information Technology in Biomedicine*, vol. 16, no. 4, pp. 633-643, July 2012.
26. **J. Kim**, X. Huo, J. Minocha, J. Holbrook, A. Laumann, and M. Ghovanloo, “Evaluation of a smartphone platform as a wireless interface between tongue drive system and electric-powered wheelchairs,” *IEEE Trans. on Biomedical Engineering*, vol. 59, no. 6, pp. 1787-1796, June 2012.

27. B.C. Lee, **J. Kim**, S. Chen, and K.H. Sienko, "Cell phone based balance trainer," *J. Neuroeng. Rehabil*, vol 9. no. 10, pp. 1-14, Feb. 2012.

Peer-reviewed Conference Proceedings

Under Review:

1. B. Irava, K. Aichelmann, **J. Kim**, "Development of the Low-cost Lightweight Exoskeleton System that Enables Social Interaction Activities in Quadriplegic Patients," submitted to 44th Annual Intl. Conf. IEEE EMBS, Scotland, UK, 2022.
2. B. Jiang, J. Han, **J. Kim**, "A Wearable In-home Tremor Assessment System via Virtual Reality Environment for the Activities in Daily Lives (ADLs)," submitted to 44th Annual Intl. Conf. IEEE EMBS, Scotland, UK, 2022.

Published or Presented:

3. B. Irava, K. Aichelmann, **J. Kim**, "Low-cost wearable exoskeleton system for interactive tasks for quadriplegia," 2022 i (ISIITA), Jeju Island, S. Korea, Feb. 2022.
4. B. Jiang, **J. Kim**, "Virtual reality-based Tremor assessment via a wearable arm device," 2022 Intl Symposium on Innovation in Information Technology and Application (ISIITA), Jeju Island, S. Korea, Feb. 2022.
5. B. Jiang, **J. Kim**, H. Park, "Both Tactile and Visual Feedback Improves Tongue Motor Ability in Pointing the Target on Palatal Surface, but Only Tactile Feedback Led to Stronger Retention," Annual Meeting of Society for Neuroscience 2021.
6. Z. Zhao, **J. Kim**, H.Park, "Individual Characterization of Drawing Pattern in a Pattern Lock Application of the Smartphone," 2021 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC).
7. H. Park, M. Kiani, H.M. Lee, A. Farajidavar, **J. Kim**, "Current Trends in Bioelectronic Systems to Interface with the Human Nervous System," Minisymposia in Engineering in Medicine and Biology Society (EMBS), 2020 Annual International Conference of the IEEE, July 2020.
8. B. Jiang, H. Park, **J. Kim**, "Multifunctional intraORal Assistive technology (MORA) with Sensory Feedback to the Tongue," IEEE EMBS Conference on Neural Engineering (NER'19), Mar. 2019.
9. **J. Kim**, T. Wichmann, Omer T. Inan, and S.P. DeWeerth, "Evaluation of a Wearable Tremor Modulation Device for Patients with Essential Tremor Based on Electrical Peripheral Nerve Stimulation," Annual Meeting of *Society for Neuroscience 2016*, San Diego, CA, Nov. 2016.
10. **J. Kim**, C. Parnell, T. Wichmann, and S.P. DeWeerth, "Quantitative Assessment of Arm Tremor in People with Neurological Disorders," In *Engineering in Medicine and Biology Society (EMBS), 2016 Annual International Conference of the IEEE*, pp. 2299-2302, Aug. 2016.
11. **J. Kim**, C. Parnell, T. Wichmann, and S.P. DeWeerth, "Longitudinal Wearable Tremor Measurement System with Activity Recognition Algorithms for Upper Limb Tremor," In *Engineering in Medicine and Biology Society (EMBS), 2016 Annual International Conference of the IEEE*, pp. 6166-6169, Aug. 2016.
12. **J. Kim**, C. Bulach, K. M. Richards, D. Wu, A.J. Butler, and M. Ghovanloo, "An Apparatus for Improving Upper Limb Function by Engaging Synchronous Tongue Motion," *International IEEE EMBS Neural Engineering Conference*, pp. 1574-1577, Nov. 2013.
13. H. Park, **J. Kim**, and M. Ghovanloo, "Intraoral tongue drive system demonstration," In *IEEE Biomedical Circuits and Systems Conference (BioCAS)*, pp. 81-81, Nov. 2012.
14. H. Park, **J. Kim**, and M. Ghovanloo, "Development and preliminary evaluation of an intraoral tongue drive system," In *Engineering in Medicine and Biology Society (EMBS), 2012 Annual International Conference of the IEEE*, pp. 1157-1160, Aug. 2012.
15. **J. Kim**, H. Park, and M. Ghovanloo, "Tongue-operated assistive technology with access to common smartphone applications via Bluetooth link," In *Engineering in Medicine and Biology Society (EMBS), 2012 Annual International Conference of the IEEE*, pp. 4054-4057, Aug. 2012.
16. H. Park, B. Gosselin, M.Kiani, H. Lee, **J. Kim**, X. Huo, and M.Ghovanloo. "A wireless magnetoresistive sensing system for an intra-oral tongue-computer interface." In *Solid-State Circuits Conference Digest of Technical Papers (ISSCC), 2012 IEEE International*, pp. 124-126, 2012.
17. H. Park, **J. Kim**, X. Huo, I.O. Hwang, and M. Ghovanloo, "New ergonomic headset for tongue-drive system with wireless smartphone interface," In *Engineering in Medicine and Biology Society (EMBS), 2011 Annual International Conference of the IEEE*, pp. 7344-7347, Aug. 2011.
18. H. Park, **J. Kim**, X. Huo, I. Hwang, M. Ghovanloo, "New ergonomic headset for tongue-drive system with wireless smartphone interface," *RESNA/ICTA 2011*, Toronto, Canada, June 2011.

19. **J. Kim**, X. Huo, and M. Ghovanloo, "Wireless control of smartphones with tongue motion using tongue drive assistive technology," In *Engineering in Medicine and Biology Society (EMBS), 2010 Annual International Conference of the IEEE*, Buenos Aires, Argentina, pp. 5250-5253, Sept. 2010.
20. **J. Kim**, K. H. Sienko, "The design of a cell-phone based balance-training device," *Design of Medical Devices Conference*, Minneapolis, MN, April 14-16, 2009.
21. P. Angkitittrakul, D. Kwak, S. Choi, **J. Kim**, A. PhucPhan, A. Sathyanarayana, J.H.L. Hansen, "Getting Start with UTDrive: Driver-Behaviour Modeling and Assessment of Distraction for In-Vehicle Speech Systems", *Interspeech 2007*, Antwerp, Belgium, pp. 1334-1337, Sept. 2007.
22. S. Choi, **J. Kim**, D. Kwak, J.H.L. Hansen "Analysis and Classification of Driver Behavior using In-Vehicle CAN-Bus Information," *Biennial Workshop on DSP for In-Vehicle and Mobile Systems*, Istanbul, Turkey, pp.17-19, June 2007.

Peer-reviewed Journal Abstract

1. E.J. Roth, J. Bruce, M. Ghovanloo, J.S. Holbrook, X. Huo, **J. Kim**, A.E. Laumann, and et al. "The Tongue Drive System: Testing Novel Assistive Technology that Uses Magnetic Signals Derived from Tongue Movements." *Physical medicine and rehabilitation (PM&R)*, vol. 4, no. 10, pp. S182-S183, Oct. 2012.
2. J.S. Minocha, J.S. Holbrook, **J. Kim**, E. Sutton, J. Bruce, D.R. West, and A.E. Laumann, "Oral plethysmography: A novel method to clinically assess tongue swelling," *Journal of Investigative Dermatology*, vol. 132, pp. S87-S87, May 2012.
3. J. Minocha, J. Holbrook, B. Yousefi, **J. Kim**, X. Huo, D. Rowles, B. Bartlett et al. "Use of a magnet-containing barbell in the tongue to operate the tongue drive system." *Journal of Investigative Dermatology*, vol. 131, pp. S81-S81, 2011.
4. **J. Kim**, and K. H. Sienko, "The design of a cell phone based balance-training device," *ASME Journal of Med. Devices*, vol. 3, no. 2, June 2009.

PATENTS

1. H. Park, **J. Kim**, and S. P. DeWeerth, "Apparatus and System for Electrically Stimulating the Oral Cavity," Filing date: Oct. 30, 2017, U.S. Provisional Application Serial No. 62/578,720.

FUNDING ACTIVITIES

Funded proposals:

- "Battery-Free Intraoral Device For Assistive Technology And Therapeutic Applications," **Texas A&M Triads for Transformation (T3)**, PIs: Dr. Hangu Park, Dr. Jeonghee Kim, Dr. David L Wright, \$30,000 (Kim's share: \$10,000), 01/01/2021-12/31/2021, Non-peer reviewed & Internal Seed Grant.
- "[Capstone Project] At-home medical device that cools skin in a location by pumping cooled water into a wearable bladder over an area of the body during post-op recovery," **Advanced Ambulatory**, Role: Faculty Advisor, \$10,000, Industry Sponsored Project.
- "FW-HTF-RM: The Future of Teleoperation in Construction Workplaces" **National Science Foundation, Future of Work at the Human-Technology Frontier: Core Research**, Award number: 2026574, PIs: Drs. Youngjib Ham, Hangu Park, Jeonghee Kim, Mindy Bergman, S Camille Peres, 01/01/2021-12/31/2023, \$1,380,612 (Kim's share: \$245,691), Peer review & Highly Competitive Federal Grant.
- "CRII: CHS: TongueWrite: An efficient tongue-based text-entry method using Multifunctional intraORal Assistive technology (MORA)" **National Science Foundation, Research Initiation Initiative (CRII)**, Award Number: 1948503, PI: Dr. Jeonghee Kim, \$175,000, 09/01/2020-08/31/2022, Peer review & Highly Competitive Federal Grant.
- "Multifunctional intraORal Assistive technology (MORA) to interface with Home Environment," **Department of Veterans Affairs, Specially Adapted Housing Assistive Technology (SAHAT) Grant**, PIs: Dr. Hangu Park, Dr. Jeonghee Kim (Role: Co-PI), \$199,999 (Kim's share: \$35,566), 04/01/2019-12/31/2020, Peer reviewed & Highly Competitive Federal Grant.

- “Muscle Synergies, Assistive Devices and the Control Of Movement,” **Texas A&M Triads for Transformation (T3)**, PIs: Dr. Louis G Tassinary, Dr. Jeonghee Kim, Dr. Takashi Yamauchi, \$35,195 (Kim’s share: \$11,731), 01/01/2019-12/31/2021, Non-peer reviewed & Internal Seed Grant.
- “Longitudinal Tremor Monitor and Stimulation (LTMS) System for Patients with Parkinson's disease and Essential Tremor,” **Texas A&M University, The College of Engineering and the College of Education and Human Development Seed Grant**, PI: Dr. Jeonghee Kim, \$37,177, 01/01/2019-12/31/2021, Peer reviewed & Internal Seed Grant.

Pending proposals:

- “NRI: Human-robot Interface for Extraterrestrial Construction,” **National Science Foundation**, PIs: Drs. Youngjib Ham, Hangu Park, Jeonghee Kim, Gregory Chamitoff, and Thomas Ferris, (Role: Co-PI), Submitted on 2/22/2022, \$1,499,988 (Kim’s share: \$222,259), **Status: Pending**; Peer reviewed & Highly Competitive Federal Grant.
- “Peripheral Sensory Stimulation for motor rehabilitation,” **National Institute on Disability, Independent Living, and Rehabilitation Research**, PIs: Drs. Shuo-Hsiu Chang, Hangu Park, Jeonghee Kim (Co-I), submitted: 1/25/2021, \$1,000,000, Status: Pending.
- “Wearable sensory stimulation to promote gait performance in persons with multiple sclerosis,” **Multiple Sclerosis Foundation**, PIs: Drs. Shuo-Hsiu Chang, Hangu Park, Jeonghee Kim (Co-I), submitted: 12/25/2021, \$251,357 (sub-recipient cost for TAMU), Status: Pending.
- “Wearable sensory stimulation to promote gait performance in persons with multiple sclerosis,” **National Science Foundation**, PIs: Drs. Hangu Park, Byung-jun Yoon, Shuo-Hsiu Chang, Jeonghee Kim (Co-I), submitted: 01/25/2022, \$400,000, Status: Pending.
- “Role of Anthropomorphicity for Osseointegrated Powered Prosthetic Foot with Intuitive Control and Sensation,” **DOD-Army-Medical Research and Materiel Command**, PIs: Drs. Mark Pitkin, Hangu Park, Jeonghee Kim, Saurabh Biswas.
- “Transforming anthropomorphic Free-Flow Foot (FFF) prosthesis to the powered foot prosthesis with intuitive control and sensation (Bionic FFF),” **Department of Defense**, PIs: Drs. Mark Pitkin, Hangu Park, Jeonghee Kim, Saurabh Biswas.
- “Anthropomorphic powered foot and ankle prosthesis with intuitive bidirectional control and sensation,” **National Institutes of Health**, PIs: Drs. Mark Pitkin, Hangu Park, Jeonghee Kim, Saurabh Biswas.

STUDENT MENTORING ACTIVITIES

Texas A&M University (2018-Present)

Graduate Research Assistant:

- **Bing Jiang**: PhD Student, Electrical and Computer Engineering, Texas A&M University (Co-chair with Dr. Hangu Park), “Development and Analysis for Intuitive and Multifunctional intraORal Assistive technology (MORA) for People with High-level Spinal Cord Injuries,” Spring 2019-Present.
- **Ziqi Zhao**: PhD Student, Electrical and Computer Engineering, Texas A&M University (Co-chair with Dr. Hangu Park), “Quantitative Upper Limb Tremor Measurement using Computer and Virtual-reality based Assessment Method for People with Arm Dominant Tremor,” Aug. 2019-Jun. 2020.
- **Jeong Jae Han**: PhD Student, Interdisciplinary Engineering Ph.D. program, “Quantitative Upper Limb Tremor Measurement using Computer and Virtual-reality based Assessment Method for People with Arm Dominant Tremor,” Fall 2020-Summer 2021.
- **Rowland Ramos**: Master of Science, Engineering Technology, Texas A&M University (Co-chair with Dr. Fink), “An Algorithm for an IoT Prawn Feeder in Conjunction with an Aquaponics System,” Mar. 2020.
- **Leon Xu**, MS Student, Engineering Technology, “Evaluation of the Capacitive Tongue Assistive Technology for Text Entry for People with High-level Spinal Cord Injuries,” Fall 2020-Present.
- **Cameryn Lopez**, MS Student, Engineering Technology, “Development of real-time pipeline monitoring system for construction work (excavator),” Fall 2020-Present.
- **Travis Simons**, MS Student, Engineering Technology, “Evaluation of Peripheral Nerve Stimulation on Split-belt Treadmill for People with Spinal Cord Injury,” Spring 2021-Present.
- **Bernard Andre Irava**, MS Student, Engineering Technology, “Development and evaluation of the lower-limb robotic exoskeleton via tongue-controlled assistive technology,” Graduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Fall 2021-present.

- **Kevin Aichelmann**, MS Student, Engineering Technology, “Development and evaluation of the wearable soft-robotic exoskeleton hands via tongue-controlled assistive technology,” Graduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Fall 2021-present.

Committee:

- **Derrick B. Knox**: Master of Science, Electrical and Computer Engineering, Texas A&M University (role: Committee member), “Forehead Phantom Sensation Suggests that Phantom Sensation is Affected by Visual Feedback and Perceived Risk and Accompanies Increase in Tactile Sensitivity,” Mar. 2020.

Undergraduate Research Assistant:

- **Michael Parulian**, “Development of the upper-limb robotic exoskeleton system,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Aug. 2021-present.
- **Bernard Andre Irava**, “Development and evaluation of the lower-limb robotic prosthetic model,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, May 2020- Aug. 2021.
- **Umair Sheikh**, “Development and evaluation of the lower-limb robotic prosthetic model,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, May 2021-Aug. 2021.
- **Travis Simons**, “Intraoral Tongue Assistive Technology and Development,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Aug. 2020-Dec. 2020.
- Summer 2020 Research Team1 (**Marissa Soria, Quoc Khanh Tran, James Kinard, Sarai Soch Nino**), “ESET 359 Lab Kit Development,” Undergraduate Student, Texas A&M University.
- Summer 2020 Research Team2 (**Christopher Davila, Rodrigo Lopez Arteaga, Bernard Irava**), “Exoskeleton development for Tongue Assistive Technology,” Undergraduate Student, Texas A&M University.
- Summer 2020 Research Team3 (**Brian Nguyen, Gabriel Fula-Pinto, Kelly Lozano**), “Necklace design of Tongue Assistive Technology,” Undergraduate Student, Texas A&M University.
- **Sherman Wilder**, “Stand-alone Assistive Technology Interface for Home Assistant,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Jan. 2020-May 2020.
- **Praneeth NG**, “Development of Capacitive-based Multi-array Intra-oral Assistive Technology,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution, Multidisciplinary Engineering Technology, Jan. 2020-May 2020.
- **Allen Liu**, “Design of Multi-array Electrodes for Facial Electromyogram,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution: Search Results, Multidisciplinary Engineering Technology, Fall 2019- May 2020.
- **Jacob Faseler**, “Multi-array Electromyogram Circuit Design,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology, Summer 2019-Fall 2019.
- **Leon Xu**, “Smart Rodent Cage System,” Undergraduate Student, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology, Summer 2019-Spring 2020.

Capstone Design Projects:

- **LenTech (Tiana Rivas, Olivia Perez Maldonado, Kevin J Abbott, Justin Block)**, “Development of a capacitive sensing array for the intraoral assistive technology,” Spring 2022-Fall 2022, Texas A&M University, Engineering Technology & Industrial Distribution.
- **Earth Vision (Heidi Mercedes Muro, Alexia M Narro-Alvers, Vannesa Reyes, Alex Hartman)**, “Development of real-time magnetic deformation detection system for the underground ferromagnetic pipeline on the excavator,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.
- **MAAS Excavation Solution (Alyssa Chang, Sarai Soch Nino, Marissa Elyse Soria, Alexis Torres)**, “Development of virtual-reality excavation training system with vibrotactile feedback to avoid the excavation

accident for the underground pipeline,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.

- **MAKI Robotics (Case R Ashton, Bernard Andre Irava, Katelin J Krumrey, Marvin Alejandro Melgar)** “Development of the Kinematic Assistive Robotic Arm to help those with spinal injuries in performing emotive and directional actions in their daily life,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.
- **Stabilicore (Nathaniel Charles Blevins, Shruthin Sunil Chirayath, Macy Morgan McCluney, Elias R Sanchez)** “Development of a motor-controlled balance board that can be used to provide personalized physical therapy programs for patients who have suffered from damaged nerve endings,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.
- **AqueDuct (Adrian Sean Fetterley, Chance Lynn Grunwald, Christian Veloz, Prashant Subedi)** “At-home medical device that cools skin in a location by pumping cooled water into a wearable bladder over an area of the body during post-op recovery,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.
- **TremTech (Christian Alexander Garza, Walker Robinson Lee, Mitchell Everett Mikula, Raghav Suresh)**, “Development of an arm wearable device capable of recording the users tremor movement while they perform a series of simulated real-life tasks in a virtual reality environment,” Fall 2020- Spring 2021, Texas A&M University, Engineering Technology & Industrial Distribution.
- **T.A.N.K. Systems (Kyle Seaman, Aaron Smith, Nik Grujicic, Tommy Rogers)**, “Development of an automated split-belt treadmill for human rehabilitation” Spring 2020-Fall 2020, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology and Multidisciplinary Engineering Technology.
- **Chair X, (Michael Mpwo, Hector Alvarez, Katherine Castaneda, Alejandro Almodovar)**, “Development of a VR based wheelchair training and assessment” Spring 2020-Fall 2020, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology and Multidisciplinary Engineering Technology.
- **Wildcard Developments (Samir Jiwani, Praneeth NG, Michael Schmelz, Mitchell Smith, Leon Xu)**: “Development of a real-time lab animal behavior monitoring system” Fall 2019-Spring 2020, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology.
- **Quadra Home (Eric Keller, Steven Fields, Ricky Flores, Sherman Wilder)**: “Development of a Wireless Interface for the Smart Home Environmental System using Multifunctional intraORal Assistive technology (MORA) for People with High-level Spinal Cord Injuries” Spring 2019-Fall 2019, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology and Multidisciplinary Engineering Technology
- **COR Tek (Alex Valdez, Andrew Neely, Stephanie Herman, Michael McCreight)**: “Development of a Smartphone-Wireless Interface for the Electrical-Powered Wheelchair using Multifunctional intraORal Assistive technology (MORA) for People with High-level Spinal Cord Injuries” Spring 2019-Fall 2019, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology and Multidisciplinary Engineering Technology
- **SIX Metrics (William Berglund, Trent Minier, Nicholas Fohn, Marcus Ramirez)**: “Development of Virtual Reality based Tremor Monitoring System (V-TMS),” Spring 2019-Fall 2019, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology.
- **SPINE (Tony W. Romero Jr., Kendall Young, Leslie Barreto, Charlie Giang)**: “Development of closed-loop insect treadmill with real-time stimulation system,” Fall 2018-Spring 2019, Texas A&M University, Engineering Technology & Industrial Distribution: Electronic System Engineering Technology.

Georgia Institute of Technology (2010-2017)

- **Claire K. Parnell**: “Analysis of the Research Questionnaire for non-motor symptoms for people with essential tremor,” Spring 2016, Georgia Tech, BME.
- **Miguel S. Flores**: “Reducing delay in hand mentor to improve to expand clinical functionality,” Summer 2015-Spring 2016, Georgia Tech, BME.
- **Ravinderjit Singh**: “The closed-loop optimization of deep brain stimulation programming,” Summer 2015-Spring 2016, Georgia Tech, BME.
- **Dixita Patel, Upekha Ruwanara Ananda, Devon James King, Armin Jamaledin**: “Tongue-Operated Rehabilitation Robotic Interface,” Senior Design Group, Fall 2012, Georgia Tech, BME.

- **Sylmarie Dávila-Montero:** “Universal Graphical User Interface Design for the Tongue Drive System,” Summer Undergraduate Research in Engineering/Science (SURE) Program 2012, Georgia Tech.
- **Revanth Rameshkumar:** “Interfacing the Tongue Drive System with Android Phones for Environmental Control,” High school Student, Fall 2011 - Spring 2012
- **Jecolia Longchi:** “Wireless Interface between Tongue Drive System and Android via Bluetooth,” Summer Undergraduate Research in Engineering/Science (SURE) Program 2011, Georgia Tech.
- **Temí Olubanjo:** “A comparison between Tongue Drive System and 4 other Assistive Technologies: Sip’n’Puff, Eye Tracker, Voice Control, and Head Mouse,” Summer Undergraduate Research in Engineering/Science (SURE) Program 2010, Georgia Tech.

TEACHING

- **ESET 359: Electronic Instrumentation**
Texas A&M University, Engineering Technology and Industrial Distribution
 Teaching Evaluation: 4.48/5.00 (Total Enrollment: 29, Response Rate: 69%) **Fall 2018**
 Teaching Evaluation: 4.36/5.00 (Total Enrollment: 52, Response Rate: 75%) **Spring 2019**
 Teaching Evaluation: 4.10/5.00 (Total Enrollment: 62, Response Rate: 82%) **Fall 2019**
 Teaching Evaluation: 4.13/5.00 (Total Enrollment: 80, Response Rate: 94%) **Spring 2020**
 Teaching Evaluation: 4.69/5.00 (Total Enrollment: 97, Response Rate: 83%) **Fall 2020**
 Teaching Evaluation: 4.50/5.00 (Total Enrollment: 113, Response Rate: 70%) **Spring 2021**
 Teaching Evaluation: /5.00 (Total Enrollment: 115, Response Rate: %) **Fall 2021**
 Teaching Evaluation: /5.00 (Total Enrollment: 131, Response Rate: %) **Spring 2022**

PRESENTATIONS

Invited Talk and Guest lecture:

- **Invited Speaker,** System design for Biomedical and Rehabilitation Applications, 2021 International Conference on Future Intelligent Computing (ICFIC 2021), Daegu, South Korea, Nov. 18-19, 2021.
- **Invited Speaker,** “How to Approach Revolutionary Biomedical and Rehabilitation Systems” Seoul National University Hospital, Department of Biomedical Engineering, Aug. 2021.
- **Invited Speaker,** “How to Approach Revolutionary Biomedical and Rehabilitation Systems” KAIST, Department of Electrical Engineering, July 2021.
- **Invited Speaker,** “Linking Biomedical Technology and Mobile App Industry” Gyeongbook Smart Mobile Application Center Seminar, Daegu, July 2021.
- **Guest Lecture,** “**Multifunctional interORal Assistive technology (MORA),**” ECEN 333: At the Interface of Engineering and Life Sciences, Texas A&M University, Jan. 28, 2021.
- **Invited Speaker,** Texas A&M Engineering: SoundBytes - Ask an Engineer: **What is assistive technology?** Texas A&M Podcast Network, Season 2 Episode 10, Oct. 13, 2020.
- **Invited Speaker,** “**The future of healthcare: wearable, mobile, and non-invasive technology for health**” 2020 KWiSE (Korean-American Women in Science and Engineering) Annual Conferences, Oct 2020 (Virtual conference).
- **Speaker,** “**Peripheral-Nerve Electrical Stimulation for Upper-Limb Tremor Modulation using a Wearable Wrist Device**” Minisymposia In Engineering in Medicine and Biology Society (EMBS), 2020 Annual International Conference of the IEEE, July 2020 (Virtual conference).
- **Guest lecture,** “**Multifunctional intraORal Assistive technology (MORA) and Ability Based Design,**” NUR 371: Disability over the Life Course, University of Texas at Austin, School of Nursing, Feb. 12, 2020.
- **Invited Talk,** “Tongue-Operated Assistive Technologies: Current Advances and Future Directions,” 2019 Quality Long-Term Care Conference, Texas HHS, Austin, TX. 8/12/2019.
- **Invited Seminar,** Wearable Mobile and Non-invasive Technology for Neurological and Physical Disorder, Korean Aggies Bio Association (KABA), 3/28/2019
- **Invited Seminar,** “Preparing Application to tenure-track faculty positions,” Workshop of Korean-American Women in Science and Engineering at Texas A&M University Chapter (KWiSE @ TAMU), 11/7/2018

- **Invited Seminar**, “Future of Healthcare: Wearable, Mobile, and Non-Invasive Technology for Human,” ECE Lecture Series (Malone Center), *Johns Hopkins University*, April 2017.
- **Invited Seminar**, Nurse Engineering, *University of Massachusetts*, March 2017.
- **Invited Seminar**, ECE, *University of Texas at Dallas*, March 2017.
- **Invited Lecture**, ECE Lecture Series, *Rutgers University*, March 2017.
- **Invited Seminar**, ECE, *University of Tennessee at Knoxville*, Feb. 2017.

Conference presentation (poster and oral presentation):

- **Poster Presentation**, “Multifunctional intraORal Assistive technology (MORA) with Sensory Feedback to the Tongue,” IEEE EMBS Conference on Neural Engineering (NER’19), March 2019.
- **Poster presentation**, “Evaluation of a Wearable Tremor Modulation Device for Patients with Essential Tremor Based on Electrical Peripheral Nerve Stimulation,” *SfN 2016*, San Diego, CA, Nov. 2016.
- **Poster presentation**, “Evaluation of a Wearable Tremor Modulation System for People with Kinetic Tremor Based on Electrical Peripheral Nerve Stimulation,” *Rising Star 2016*, Carnegie Mellon University, Pittsburgh, PA, Oct. 2016.
- **Poster presentation**, “Evaluation of a Real-time Closed-loop Tremor Modulation for People with Kinetic Tremor using Peripheral Nerve Stimulation,” *NextProf Engineering 2016*, University of Michigan, Ann Arbor, Sep. 2016.
- **Oral presentation**, “Real-time closed-loop tremor modulation using peripheral-nerve stimulation,” *NSF Young Professional Award EMBC 2016*, Orlando, FL, Aug. 2016.
- **Oral presentation**, “Longitudinal Wearable Tremor Measurement System with Activity Recognition Algorithms for Upper Limb Tremor,” *EMBC 2016*, Orlando, FL, Aug. 2016.
- **Poster presentation**, “Quantitative Assessment of Arm Tremor in People with Neurological Disorders,” *EMBC 2016*, Orlando, FL, Aug. 2016.
- **Poster presentation**, “Quantitative Assessment and Longitudinal Monitoring System of Arm Tremor in People with Neurological Disorder,” Career, Research, Innovation and Development Conference 2016 (*CRIDC*), Georgia Institute of Technology, Atlanta, GA, Mar. 2016.
- **Poster Presentation**, “Evaluation for Improving Upper Limb Function by Engaging Synchronous Tongue Motion,” *Georgia Tech Research & Innovation Conference 2014*, Mar. 2014.
- **Poster presentation and demonstrations**, “Tongue Drive System,” *3rd Annual SSEF STEM Event 2013*, Health Science & Technology, Feb. 2013.
- **Poster Presentation**, “Dual-center Clinical Assessment of the Tongue Drive System,” *Georgia Tech Research & Innovation Conference 2013*, Feb. 2013.
- **Oral presentation**, “Tongue-operated assistive technology with access to common smartphone applications via bluetooth link,” *EMBC 2012*, San Diego, Aug. 2012.
- **Presentation**, “Dual-Center Clinical Assessment of the Tongue Drive System” *IEEE EMB/CAS/SMC Workshop on Brain-Machine-Body Interfaces*, Aug. 2012.
- **Poster Presentation**, “Brain-Tongue Computer Interfacing” *Neural Computer Interface 2010* Conference, Long Beach, CA, June 2010.
- **Poster Presentation**, “The design of a cell phone based balance training device” *Design of Medical Devices Conference*, Minneapolis, MN, 2009.
- **Poster Presentation**, Compliance Conference, University of Texas System, Austin, TX, 2007.
- **Poster Presentation and demonstrations**, *SEEK SQUARE Exhibition*, Kyungpook National University, ECE Department, 2003-2004.
- **Poster Presentation and demonstrations**, *Brain KOREA 21 ANNUAL Exhibitions* at COEX, Seoul, Korea, 2003.

Other presentations:

- **Presentation**, Fall 2018 ESET Industry Advisory Committee (IAC) Meeting, 11/1/2018
- **Poster presentation and demonstrations**, “Tongue Drive System,” *5th Annual Healthy Environments and Active Lifestyle Open House*, Georgia Institute of Technology, Atlanta, GA, Apr. 2013.
- **Presentation and demonstrations**, “Tongue Drive System,” *Ability Expo*, Feb. 2013.
- **Presentation and demonstrations**, “Tongue Drive System,” *TEDx Peachtree*, Sep. 2012
- **Presentation and demonstrations**, “Tongue Drive System,” *Ability Expo*, Feb. 2012.

- **Poster presentation and demonstrations**, “Tongue Drive System,” *Center for Assistive Technology and Environmental Access Open House*, Georgia Institute of Technology, Atlanta, GA Mar. 2011.
- **Poster presentation and demonstrations**, “Tongue Drive System,” *Center for Assistive Technology and Environmental Access Open House, Georgia Institute of Technology*, Atlanta, GA, Apr. 2010.
- **Presentation and demonstrations**, “Tongue Drive System,” *Ability Expo*, Oct., 2010.

SERVICES

- ETID Honors and Awards Committee **Sep. 2021-present**
- 2020, 2021 WISSET (Korea Center for Women in Science, Engineering, and Technology) Mentoring Program, Faculty Mentor **May 2020-present**

Journal Reviewer:

- Reviewer in Biomedical Microdevices **2021–present**
- Reviewer in IEEE Open Journal of Intelligent Transportation Systems **2021–present**
- Reviewer in IEEE Transactions on Biomedical Engineering (Impact Factor: 5.20) **2021–present**
- Reviewer in IEEE Sensors Journal (Impact Factor: 3.076) **2020–present**
- Reviewer of Journal of Biomechanics **2019–present**
- Reviewer of the Computers and Electronics in Agriculture **2017–present**
- Reviewer of the International Journal of Human – Computer Studies **2017–present**
- Reviewer of the International Conference on Biomedical Engineering and Biotechnology **2013–2015**

Funding Agency Review Panel:

- Invited Review Panel and Study Section for University of Nebraska Medical Center **Dec. 2020, Dec. 2021**
- NSF Review Panel **Apr. 2020**

Editorial boards:

- Invited Guest Editor, *Frontiers in Neuroscience* (Impact Factor: 3.566) **2020–present**
- Invited Topic Editor, Guest Editor, Reviewer in *MDPI Electronics* (Impact Factor: 2.412) **2019–present**

Departmental service:

Texas A&M University

- Honors and Awards Committee, ETID, Texas A&M University **2021–present**
- Aggieland Saturday, EMG-controlled robot demonstration **Feb. 2020**
- DI Saturday: ESET program introductory presentation **Nov. 2019**
- Engineering Tailgate Event: Virtual Reality Tremor Assessment Demo & Grasshopper Treadmill **Oct. 2019**
- K-12 Outreach: All Nations Community School; VR tremor assessment Demo **Oct. 2019**
- Aggieland Saturday, EMG-controlled robot demonstration **Feb. 2019**

Georgia Institute of Technology

- 2015 BME Graduate Student Recruitment, Georgia Tech **Mar. 2015**
- 2014 BME and BIOE Student Recruitment, Georgia Tech **Mar. 2014**
- 2013 Annual ECE RUSH (Undergraduate Student Outreach) **Aug. 2013**
- K-12 Outreach events
United Scientist of Rockbridge (4th and 5th grade; Feb. 2013), State Bridge Crossing Elementary School (4th grade; Jan 2013), Lake Forest Elementary School (5th grade; Nov. 2012), State Bridge Crossing Elementary School (4th grade, Jan. 2012)

PROFESSIONAL MEMBERSHIPS

- Korean-American Women in Science and Engineering at Texas A&M University Chapter **Aug. 2018-present**
- Member in the Korean-American Women in Science and Engineering at Texas A&M University Chapter (KWISE @ TAMU) **2018–present**
- Member of the American Association for the Advancement of Science (AAAS) **2016–present**
- Member in Society for Neuroscience (SfN) **2016–present**

- Member in Biomedical Engineering Society (BMES) **2014–present**
- Member in IEEE Women in Engineering Membership **2013–present**
- Member in IEEE Engineering in Medicine and Biology Society **2010–present**
- Member in Institute of Electrical and Electronics Engineers (IEEE) **2010–present**

LANGUAGES

Korean and English

VISA STATUS

U.S. Permanent Resident