Curriculum Vitae

Jihye Bae August 13, 2025

Contact Information

Address: University of Kentucky, Department of Electrical and Computer Engineering
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Education

Doctor of Philosophy (5 Jan. 2010 ~ 13 Aug. 2013) Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL, USA.

Master of Science (25 Aug. 2008 ~ 22 Dec. 2009) Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL, USA.

Bachelor of Engineering (3 Mar. 2003 ~ 23 Feb. 2007) School of Electrical Engineering and Computer Science, Kyungpook National University, Daegu, South Korea.

Professional Experience

Assistant Professor (1 Aug. 2019 ~ Present)
Department of Electrical and Computer Engineering, University of Kentucky, Lexington, KY, USA.
Leader of the Neural Interfaces and Signal Processing (NISP) Lab.

Postdoctoral Associate (9 Apr. 2018 ~ 31 Jul. 2019)
Applied Neural Interfaces (ANI) Laboratory, Department of Biomedical Engineering, Florida International University, Miami, FL, USA.
Supervisor: Dr. Zachary Danziger

Postdoctoral Associate (6 Jul. 2015 ~ 14 Jan. 2016)
The Miami Project to Cure Paralysis, University of Miami, Miami, FL, USA.
Supervisor: Dr. Monica A. Perez

Postdoctoral Associate (12 Nov. 2013 ~ 2 Jul. 2015)
Neuronal Mass Dynamics (NMD) Laboratory, Department of Biomedical Engineering, Florida International University, Miami, FL, USA.
Supervisor: Dr. Jorge J. Riera

Graduate Research Assistant (16 Aug. 2010 ~ 15 May 2013)
Computational Neuro-Engineering Laboratory (CNEL), Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL, USA.
PI: Dr. Jose C. Principe
Supporting Agency: The Defense Advanced Research Projects Agency (DARPA).

Research Assistant (May ~ Jun. 2009)
Water Resources Engineering Laboratory, Department of Civil Engineering, Keimyung University, Daegu, South Korea.

Volunteer Teaching Assistant (Apr. ~ May 2007)
Tates Creek High School, Lexington, KY, USA.
Teaching Subjects: Geometry and Computer Applications 1.

Undergraduate Research Trainee (Jun. ~ Aug. 2005)
Biomedical Electronics Laboratory, School of Electrical Engineering and Computer Science, Kyungpook National University, Daegu, South Korea.

Volunteer Tutor (Nov. 2004 ~ Jan. 2006)
STEM Education for Low-Income Household, Wolseong Catholic Church, Daegu, South Korea.
Teaching Subject: Middle School Mathematics.

Undergraduate Research Assistant (Apr. 2004 ~ Jan. 2007)
Water Resources Engineering Laboratory, Department of Civil Engineering, Keimyung University, Daegu, South Korea.

Overseas Volunteer Teacher (Jan. ~ Feb. 2004)
Overseas Volunteer Program of Kyungpook National University, Naujan, Mindoro, Philippines.
Teaching Computer Applications to Naujan Technical College and Naujan Municipal High School Students.
Assistant Leader of the Computer Education Team.

Distinctions and Awards

2024 NEUSTAR Research Award (2024) Department of Neurosurgery, University of Kentucky, Lexington, USA.

CESL STAR Award (Oct. 2019) Center for English as a Second Language (CESL), University of Kentucky, Lexington, KY, USA.

ADVANCE Florida Network Women in STEM Scholars (AFN-WISS) Award (2019 Spring) Florida International University, Miami, FL, USA.

Achievement Award for New Engineering Graduate Students (2008 Fall ~ 2009 Fall) Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL, USA.

Brain Korea (BK) 21 Scholarship (2005 Fall) Brain Korea (BK) 21, South Korea.

Outstanding Student Scholarship (2005 Spring) Kyungpook National University, Daegu, South Korea.

Engineering Incentive Scholarship (2004 Fall) Department of Engineering, Kyungpook National University, Daegu, South Korea.

Brain Korea (BK) 21 Scholarship (2004 Spring) Brain Korea (BK) 21, South Korea.

Outstanding Student Scholarship (2003 Fall) Kyungpook National University, Daegu, South Korea.

Publications

Underline indicates student authors whom I supervised.

Journal

[1] B. R. Thapa, J. Boggess, and **J. Bae**, "A Large Electroencephalogram Database of Freewill Reaching and Grasping Tasks for Brain Machine Interfaces." (Under Review)

[2] S. Kim, D. Y. Han, and **J. Bae**. "Transforming Alzheimer's Digital Caregiving through Large Language Models." *Current Alzheimer Research*, 21(7), pp503-516, 2024. doi: 10.2174/0115672050301740241118044604. PMID: 39592896.

[3] J. Huber, S. Slone, and **J. Bae**. "Computer vision for kinematic metrics of the drinking task in a pilot study of neurotypical participants." *Nature Scientific Reports*, 14, 2024, 20668, https://doi.org/10.1038/s41598- 024-71470-8.

[4] **J. Bae**, J. Clay, B. R. Thapa, D. Powell, B. Krishnan, A. Koupparis, M. Bensalem Owen, and F. Raslau. "Process of equipment setup and artifact removal for simultaneous EEG-fMRI recordings for clinical review of interictal period in epilepsy." *Journal of Visualized Experiments*, 2023, (196), e64919, doi:10.3791/64919.

[5] P. Awasthi*, T. H. Lin*, **J. Bae**, L. E. Miller, and Z. C. Danziger. "Validation of a non-invasive, real-time, human-in-the-loop model of intracortical brain-computer interfaces." *Journal of Neural Engineering*, 2022, doi: 10.1088/1741-2552/ac97c3.

[6] B. Girdler, W. Caldbeck, and **J. Bae**. "Neural Decoders Using Reinforcement Learning in Brain Machine Interfaces: A Technical Review." *Frontiers in Systems Neuroscience*, 16, 2022, doi=10.3389/fnsys.2022.836778.

[7] W. Plucknett, L. G. Sanchez Giraldo, and **J. Bae**. "Metric Learning in Freewill EEG Pre-Movement and Movement Intention Classification for Brain Machine Interfaces." *Frontiers Human Neuroscience*, 16, 2022, doi=10.3389/fnhum.2022.902183.

[8] B. Girdler, H. Moon, M. R. Bae, S. S. Ryu, **J. Bae***, and M. S. Yu*. "Feasibility of a deep learning-based algorithm for automated detection and classification of nasal polyps and inverted papillomas on nasal endoscopic images." *International Forum of Allergy & Rhinology*, 2021, 11, pp. 1637-1646, https://doi.org/10.1002/alr.22854. (* corresponding authors)

[9] J. Fugal, **J. Bae***, and H. A. Poonawala*. "On the Impact of Gravity Compensation on Reinforcement Learning in Goal-Reaching Tasks for Robotic Manipulators." *Robotics*, 2021, 10(1), 46, https://doi.org/ 10.3390/robotics10010046. (* corresponding authors)

[10] P. A. Valdes-Hernandez, **J. Bae**, Y. Song, A. Sumiyoshi, E. Aubert-Vazquez, and J. J. Riera. "Validating Non-invasive EEG Source Imaging Using Optimal Electrode Configurations on a Representative Rat Head Model." *Brain topography*, 2019, 32(4), pp. 599-624, doi: 10.1007/s10548-016-0484-4.

[11] A. Deshmukh, J. Leichner, **J. Bae**, Y. Song, P. A. Valdes-Hernandez, W. C. Lin, and J. J. Riera. "Histological Characterization of the Irritative Zones in Focal Cortical Dysplasia Using a Preclinical Rat Model." *Frontiers Cellular Neuroscience*, 2018, eCollection 2018, doi: 10.3389/fncel.2018.00052.

[12] R. A. Macklin, **J. Bae**, M. Orell, K. D. Anderson, P. H. Ellaway, and M. A. Perez. "Time-Dependent Discrepancies between Assessments of Sensory Function after Incomplete Cervical Spinal Cord Injury." *Journal of Neurotrauma*, 2017, 34, pp. 1778-1786, doi: 10.1089/neu.2016.4433.

[13] Y. Song, R. A. Torres, S. Garcia, Y. Frometa, **J. Bae**, A. Deshmukh, W. Lin, Y. Zheng, and J. J. Riera. "Dysfunction of Neurovascular/Metabolic Coupling in Chronic Focal Epilepsy." *IEEE Transactions on Biomedical Engineering*, 2016, 63(1), pp.97-110, doi: 10.1109/TBME.2015.2461496.

[14] **J. Bae**, A. Deshmukh, Y. Song, and J. Riera. "Brain Source Imaging in Preclinical Rat Models of Focal Epilepsy using High-Resolution EEG Recordings." *Journal of Visualized Experiments*, 2015, (100), e52700, doi:10.3791/52700.

[15] **J. Bae**, L. G. Sanchez Giraldo, E. A. Pohlmeyer, J. T. Francis, J. C. Sanchez, and J. C. Principe. "Kernel Temporal Differences for Neural Decoding." *Computational Intelligence and Neuroscience*, 2015, Article ID 481375, pp. 1-17, https://doi.org/10.1155/2015/481375.

Conference Proceedings

[1] B. R. Thapa, J. Paredes, J. Bogges, A. O. Shalash, and **J. Bae**. "Classification of Error-Related Potentials in EEG-based Brain Machine Interfaces." *IEEE EMBS the 12th Annual International Conference on Neural Engineering*, 2025. (In Press)

[2] R. McDorman, B. R. Thapa, J. Kim, and **J. Bae**. "Transfer Learning in EEG-based Reinforcement Learning Brain Machine Interfaces via Q-learning Kernel Temporal Differences." *The 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2025. (In Press)

[3] B. R. Thapa and **J. Bae**. "Decoding EEG Premovement and Movement Intensions in Freewill Reaching and Grasping Tasks: Window Analysis." *The 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2025. (In Press)

[4] S. Posso-Murillo, L. G. Sanchez-Giraldo and **J. Bae**, "Semantic Reconstruction from Fnirs Using Recurrent Neural Networks," *2025 IEEE 22nd International Symposium on Biomedical Imaging (ISBI)*, Houston, TX, USA, 2025, pp. 1-5, doi: 10.1109/ISBI60581.2025.10981123.

[5] D. McCubbins, B. R. Thapa, K. Hall, and **J. Bae**. "Simple and Effective Signal Processing Techniques to Detect Electrocardiogram." *IEEE SoutheastCon 2025*, Concord, NC, USA, 2025, pp. 1349-1354, https://ieeexplore.ieee.org/document/10971511.

[6] B. Handshoe, S. Kim, and **J. Bae**. "Identifying Key Diagnostic Codes for Initial Belief State Prediction for Modeling Colorectal Cancer Screening Based on Reinforcement Learning" *IEEE SoutheastCon 2025*, Concord, NC, USA, 2025, pp. 894-899, https://ieeexplore.ieee.org/document/10971627.

[7] S. Kim, M. Dahal, A. Bhakta, and **J. Bae**. "The Role of Digital Health Literacy and Socioeconomic Factors in Colorectal Cancer Screening: Machine Learning Analysis of HINTS Data." *The 18th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2025),* 2025, vol. 2, pp 228-239, doi: 10.5220/0013310700003911.

[8] B. R. Thapa, D. Restrepo Tangarife, and **J. Bae**. "Kernel Temporal Differences for EEG-based Reinforce- ment Learning Brain Machine Interfaces." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, 2022, pp.3327-3333, doi: 10.1109/EMBC48229.2022.9871862.

[9] **J. Bae**, L. G. Sanchez Giraldo, J. T. Francis, and J. C. Principe. "Correntropy Kernel Temporal Differences for Reinforcement Learning Brain Machine Interfaces." T*he International Joint Conference on Neural Networks (IJCNN)*, 2014, pp. 2713-2717, doi: 10.1109/IJCNN.2014.6889958.

[10] **J. Bae**, L. G. Sanchez Giraldo, E. A. Pohlmeyer, J. C. Sanchez, and J. C. Principe. "A New Method of Concurrently Visualizing States, Values, and Actions in Reinforcement based Brain Machine Interfaces." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, 2013, pp. 5402-5405, doi:10.1109/EMBC.2013.6610770.

[11] A. J. Brockmeier, L. G. Sanchez Giraldo, M. S. Emigh, **J. Bae**, J. S. Choi, J. T. Francis, and J. C. Principe. "Information-Theoretic Metric Learning: 2-D Linear Projections of Neural Data for Visu- alization." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, 2013, pp. 5586-5589, doi:10.1109/EMBC.2013.6610816.

[12] **J. Bae**, L. Sanchez Giraldo, P. Chhatbar, J. Francis, J. Sanchez, and J. Principe. "Stochastic Kernel Temporal Difference for Reinforcement Learning." *IEEE International Workshop on Machine Learning for Signal Processing (MLSP)*, 2011, pp. 1-6, doi:10.1109/MLSP.2011.6064634.

[13] **J. Bae**, P. Chhatbar, J. T. Francis, J. C. Sanchez, and J. C. Principe. "Reinforcement Learning via Kernel Temporal Difference." *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)*, 2011, pp. 5662-5665, doi: 10.1109/IEMBS.2011.6091370.

Abstracts

[1] J. Paredes and **J. Bae**. "Optimizing Brain Control Interfaces Performance through EEG- Based Critical Feedback: A Time and Frequency Domain Analysis Approach." *The National Conference on Undergraduate Research (NCUR)*, 2025.

[2] S. Kim, H. Abukadah, **J. Bae**, and A. Bhakta. "Predicting CRC Screening Uptake using Machine Learning and Ensemble Models." *International Society for Pharmacoepidemiology (ISPE)*, 2024.

[3] J. Rybarczyk, J. Clay, F. D. Raslau, M. U. Khalid, F. Mirza, and **J. Bae**. "Delta Focused Ictal Electrical Source Imaging for Seizure Onset Localization in Focal Refractory Epilepsy." *Society for Neuroscience (SfN)*, 2024.

[4] S. Posso and **J. Bae**. "Semantic reconstruction using an LSTM-based decoder from fNIRS signals." *University of Kentucky ECE Research Symposium*, 2024.

[5] J. Huber, S. Slone, and **J. Bae**. "Video-Based Sensor Performance in a Real-World Rehabilitation Context: A Case Study." *Association of Academic Physiatrists (AAP) Physiatry*, 2024.

[6] J. Rybarczyk, J. Clay, F. Raslau, and **J. Bae**. "Delta Focused Ictal EEG Source Imaging for Accurate Source Localization in Refractory Focal Epilepsy." *2023 Neuroscience RPA Clinical Translational Research Symposium*, 2023 (***Selected Oral Presentation***).

[7] J. Kim and **J. Bae**. "Neural Decoding of EEG Premovement Intention using Q-learning via Kernel Temporal Differences." *2023 Neuroscience RPA Clinical Translational Research Symposium*, 2023.

[8] J. Boggess, B. Raj Thapa, and **J. Bae**. "Multichannel Electroencephalogram Database for Freewill Reaching and Grasping Tasks." *2023 Neuroscience RPA Clinical Translational Research Symposium*, 2023.

[9] J. Rybarczyk, J. Clay, and **J. Bae**. "Investigation of Ictal Electroencephalogram (EEG) Source Imaging Strategy Towards Seizure Onset Localization in Refractory Focal Epilepsy." *University of Kentucky Showcase of Undergraduate Scholars*, 2023.

[10] J. Kim and **J. Bae**. "Classification of EEG Pre-movement Intention Using Q-learning via Kernel Temporal Differences in Reinforcement Learning Brain Machine Interfaces." *University of Kentucky ECE Research Symposium*, 2023.

[11] J. Rybarczyk, J. Clay, and **J. Bae**. "Investigation of Ictal Electroencephalogram (EEG) Source Imaging Strategy Towards Seizure Onset Localization in Refractory Focal Epilepsy." *University of Kentucky ECE Research Symposium*, 2023.

[12] J. Huber and **J. Bae**. "More than Meets the Eye: Calibrating Computer Vision for Post-Stroke Upper Limb Movement." *American Society of NeuroRehabilitation*, 2023.

[13] J. Huber and **J. Bae**. "Reaching Out: Capturing Post-Stroke Upper Limb Kinematics with Computer Vision." *Annual Meeting at Association of Academic Physiatrists (AAP)*, 2023 (***Selected Oral Presentation***).

[14] J. Huber and **J. Bae**. "Reaching Further: Empowering Rehabilitation of the Post-Stroke Upper Limb with Computer Vision." *Annual Appalachian Translational Research Network (ATRN) Summit*, 2022 (***Selected Oral Presentation***).

[15] B. R. Thapa and **J. Bae**. "Detection of Pre-Movement Intention in EEG-Based Brain Machine Inter- faces." *University of Kentucky ECE Research Symposium*, 2022.

[16] T. Ainger, **J. Bae**, R. El-Khouli, F. Mirza, R. Yardi, M. Bensalem-Owen, B. Gold, P. Hardy, D. Powell, F. Raslau, and S. Sunderam. "Functional Imaging and Neuro-Diagnostics for Epilepsy and Resective Surgery." *University of Kentucky Annual KNI Clinical-Translational Research Symposium*, 2020.

[17] J. Fugal and **J. Bae**. "A Comparative Analysis of Reinforcement Learning Applied to Point-to-Point Control of the Panda Robotic Arm Using Torque Control with and without Gravity Compensation." *University of Kentucky ECE Research Symposium*, 2020.

[18] B. Girdler and **J. Bae**. "Quickly Adapting Reinforcement Learning Brain Machine Interfaces using Model Agnostic Meta Learning." *University of Kentucky ECE Research Symposium*, 2020.
[19] A. Muhury and **J. Bae**. "Real Time Cursor Control in EEG-based Brain Computer Interfaces." *University of Kentucky ECE Research Symposium*, 2020.
[20] D. Restrepo Tangarife and **J. Bae**. "Classification of Sequential Arm and Hand Movements in Brain Machine Interfaces." *University of Kentucky ECE Research Symposium*, 2020.
[21] **J. Bae**, M. G. Perich, L. E. Miller, and Z. C. Danziger. "Neural signal emulation for closed-loop intracortical brain computer interface decoder design." *Society for Neuroscience (SfN)*, 2019.
[22] **J. Bae**, P. Valdes-Hernandez, Y. Song, and J. Riera. "Electroencephalographic Source Imaging in Rats: Methodological Aspects and Validation." *Biomedical Engineering Society (BMES)*, 2015.
[23] **J. Bae**, L. G. Sanchez Giraldo, E. A. Pohlmeyer, J. T. Francis, J. C. Sanchez, and J. C. Principe. "Neural Decoding Using Kernel Temporal Difference Learning." *IEEE EMBS BRAIN Grand Challenges*, 2014.
[24] Y. Song, R. A. Torres, **J. Bae**, A. Deshmukh, W. Lin, and J. J. Riera. "Electrophysiological and Hemodynamic Signatures of Epileptic Neocortex in Rats with Focal Cortical Dysplasia: Implications on Epilepsy Surgery." *IEEE EMBS BRAIN Grand Challenges*, 2014 (***Young Investigator Award***).
[25] **J. Bae**, Y. Song, A. Deshmukh, and J. J. Riera. "An EEG Methodology to Localize the Irritative Cortices in a Preclinical Model of Focal Epilepsy." *Society for Neuroscience (SfN)*, 2014.
[26] **J. Bae**, A. Deshmukh, Y. Song, and J. Riera Diaz. "Brain Source Analysis of Interictal Epileptiform Discharges Using a Rat Model of Focal Epilepsy." *The 20th Annual Meeting of the Organization for Human Brain Mapping (OHBM)*, 2014.
[27] Y. Song, **J. Bae**, A. Deshmukh, B. G. Sanganahalli, F. Hyder, W. Lin, and J. J. Riera. "A Concurrent fMRI and EEG Study of Epileptogenesis in a Rat Model of Focal Cortical Dysplasia." *The 20th Annual Meeting of the Organization for Human Brain Mapping (OHBM)*, 2014.
[28] W. Medina, V. Sagar, H. Ding, J. Leichner, **J. Bae**, K. M. Caamano, M. Nair, and J. J. Riera. "Cognitive and Metabolic Effects of Nanoparticles on Deep Brain Activity." *The 2nd Annual BME Undergraduate Research Day*, 2014.
[29] A. Deshmukh, **J. Bae**, Y. Song, and J. J. Riera. "A Methodology to Perform Brain Source Imaging in Rats with Focal Epilepsy." *The 22nd Annual Neuroscience Research Day*, 2013.
[30] **J. Bae**, L. G. Sanchez Giraldo, J. T. Francis, and J. C. Principe. "Correntropy Kernel Temporal Difference for Reinforcement Learning." *The 8th Annual Workshop for Women in Machine Learning*, 2013.
[31] **J. Bae**, and J. C. Principe. "Kernel Temporal Differences in Reinforcement Learning Brain Machine Interfaces." *The 1st Annual Pruitt Research Day*, 2012.

Invited Talks

"Applications of Machine Learning in Healthcare." Seminar Series in the Graduate School of Medicine (May 2024) College of Nursing, Daegu Catholic University, South Korea.

"Neural Decoders in Reinforcement Learning Brain Machine Interfaces." Commonwealth Computational Summit 2023: Artificial Intelligence (Oct. 2023) Center for Computational Sciences, University of Kentucky, Lexington, KY, USA.

"Functional Imaging for NeuroDiagnostics for Epilepsy and Resective Surgery (FINDERS)" Alliance Research Initiative Event (Oct. 2023) College of Medicine, University of Kentucky, Lexington, KY, USA.

"Introduction to Brain Machine Interfaces." Seminar Series in Korean Student Association (Feb. 2020) Korean Student Association, University of Kentucky, Lexington, KY, USA.

"Neural Signal Emulation for Developing Brain Computer Interfaces." Seminar Series in the Department of Biomedical Engineering (Nov. 2019) Department of Biomedical Engineering, University of Kentucky, Lexington, KY, USA.

"Reinforcement Learning for Brain Machine Interfaces." Seminar Series in the Institute for Biomedical Informatics (Oct. 2019) Institute for Biomedical Informatics, University of Kentucky, Lexington, KY, USA.

"Development of Neural Decoders and Neural State Emulators Towards Practical Brain Machine Interfaces." Department of Computer Science Pizza Seminar Series (Nov. 2018) Department of Computer Science, University of Miami, Miami, FL, USA.

"Kernel Temporal Differences for Neural Decoding." Biomedical Engineering Research Seminar (Mar. 2017) Institute of Biomedical Engineering Research, Kyungpook National University, Daegu, South Korea.

"Reinforcement Learning via Kernel Temporal Difference." Brain Korea (BK) 21 Seminar (Jan. 2012) School of Electrical Engineering and Computer Science, Kyungpook National University, Daegu, South Korea.

Grants

1. **Role: MPI**
   Title: Transformer-based temporal action localization for functional motion classification and localization for stroke rehabilitation.
   Sponsor: Igniting Research Collaborations (IRC), University of Kentucky
   Amount Funded: **$31,525**
   Period Covered: 7/1/24 ~ 12/31/24
2. **Role: MPI**
   Title: Optimizing the FINDERS Ictal/Postictal Program for Refractory Focal Epilepsy.
   Sponsor: 2024 NEUSTAR Research Award, Department of Neurosurgery, University of Kentucky
   Amount Funded: **$86,700**
   Period Covered: 1/1/24 ~ 12/31/24
3. **Role: MPI**
   Title: Feasibility of colorectal cancer literacy intervention framework using machine learning towards effective screening and early detection.
   Sponsor: Center for Clinical and Translational Science (CCTS), University of Kentucky
   Amount Funded: **$24,276**
   Period Covered: 11/15/23 ~ 11/31/24
4. **Role: PI**
   Title: Optimizing FINDERS workflow and refining EEG-fMRI post-processing.
   Sponsor: Neuroscience Research Priority Area (NRPA), University of Kentucky
   Amount Funded: **$25,000**
   Period Covered: 9/1/23 ~ 8/31/24
5. **Role: PI**
   Title: An EEG database for goal-driven brain machine interfaces.

Sponsor: Engineering Research Mini-Grant Program, College of Engineering, University of Kentucky
Amount Funded: **$2,520**
Period Covered: 7/1/23 ~ 6/30/24

6. **Role: PI**
   Title: Evaluation of Postictal Electroencephalogram (EEG) Slowing and Development of a Postictal EEG Source Imaging Technique to Localize Seizure Onset in Epilepsy.
   Sponsor: Neuroscience Research Priority Area (NRPA)
   Amount Funded: **$25,000**
   Period Covered: 6/1/23 ~ 5/31/24
7. **Role: Co-I** (PI: B. Gold)
   Title: Integration of cutting-edge EEG-fMRI and vascular imaging (ASL and CVR) technologies.
   Sponsor: College of Medicine Alliance Research Initiative, College of Medicine, University of Kentucky
   Amount Funded: **$200,000**
   Period Covered: 7/01/20 ~ 6/30/23
8. **Role: PI**
   Title: Neuro-Engineering Workshop with EEG-focused Brainstorm Training 2020.
   Sponsor: Conference and Workshop Grant, University of Kentucky
   Amount Funded: **$3,000**
   Period Covered: 1/22/20 ~ 12/31/20

Teaching

Summary Table

Term	Course Number	Credit Hours	Student Number
2025 Spring	EE 421G - 001	3	44
2025 Spring	EE 595 - 003	3	1
2025 Spring	EE 748 - 002	0	1
2025 Spring	EE 783 - 002	3	1
2024 Fall	EE 422G - 002	2	6
2024 Fall	EE 595 - 003	3	2
2024 Fall	EE 599 - 002	3	2
2024 Fall	EE 699 - 002	3	2
2024 Fall	EE 783 - 002	3	1
2024 Spring	EE 421G - 001	3	49
2024 Spring	EE 748 - 002	0	1
2024 Spring	EE 783 - 002	3	1
2023 Fall	EE 421G - 001	3	41
2023 Fall	EE 422G - 002	2	6
2023 Spring	EE 748 - 002	0	1

Fall 2022	EE 422G – 001, 002	2	19
Spring 2022	EE 421G – 001	3	57
Fall 2021	EE 422G – 001, 002	2	10
Spring 2021	EE 421G - 001	3	45
Fall 2020	EE 599 - 005	3	3
Fall 2020	EE 699 - 003, 202	3	3
Spring 2020	EE 421G - 001	3	58
Spring 2020	EE 748 - 002	0	1
Spring 2020	EE 783 - 002	3	1
Fall 2019	EE 422G - 002	2	7

Mentoring Students

PhD

Thesis Adviser

1. Santiago Posso Murillo (Ongoing. Expected to Graduate in 2026 Fall)
2. Bhoj Raj Thapa (Ongoing. Expected to Graduate in 2026 Spring)
   Selected 2025 Lighthouse Beacon Foundation Graduate Fellow.

Committee

1. Halil Ismail Helvaci
   Advisor: Dr. Sen-Ching Cheung
2. Sidrah Liaqat
   Advisor: Dr. Sen-Ching Cheung
3. Lakmali Nadeesha
   Advisor: Dr. Sen-Ching Cheung
4. Jooan K. Hoyos Osorio (Graduated in 2024 Fall)
   Advisor: Dr. Luis G. Sanchez Giraldo

Outside Examiner

1. Clifford Seth Parker (Graduated in 2024 Spring)
   Advisor: Dr. William Brent Seales

MS

Thesis Adviser

1. William Bank (Ongoing. Expected to Graduate in 2026 Fall)
2. John P. (Trey) Boggess (Ongoing. Expected to Graduate in 2026 Fall)
3. Jared A. Rybarczyk (Graduated in 2024 Spring)
   Thesis Title: Investigation of Delta-focused Ictal Electrical Source Imaging In Refractory Focal Epilepsy.
   Continued PhD at Vanderbilt University.

Thesis Co-Adviser

1. Santiago Posso Murillo (Graduated in 2023 Fall)
   Co-Adviser: Dr. Luis G. Sanchez Giraldo
   Thesis Title: Nonuniform Sampling-based Breast Cancer Classification.
   Continued PhD under my supervision.
2. Jonathan Fugal (Graduated in 2020 Spring)
   Co-Adviser: Dr. Hasan A. Poonawala
   Thesis Title: A comparative analysis of reinforcement learning applied to task-space reaching with a robotic manipulator with and without gravity compensation.
   Hired at National Air and Space Intelligence Center, OH.

Committee

1. Lick Lanning (Graduated in 2023 Fall)
   Advisor: Dr. Luis G. Sanchez Giraldo

Undergraduate Research Supervisor

1. Benjamin Handshoe (2024 Spring ~ 2025 Spring)
2. William Bank (2024 Summer ~ 2024 Fall)
   Awarded 2024 Engineering Summer Undergraduate Research Fellowship at the University of Kentucky.
   Continued MS under my supervision.
3. Reece McDorman (2024 Spring ~ 2024 Summer)
4. Thomas Noll (2023 Fall ~ 2024 Spring)
5. Jenna Kim (2022 Summer ~ 2023 Fall)
6. Jared A. Rybarczyk (2022 Fall ~ 2023 Spring)
   Awarded 2022 College of Engineering Undergraduate Research Fellowship at the University of Kentucky.
   Awarded 2022 ECE Undergraduate Research Fellowship at the University of Kentucky.
   Continued MS under my supervision.
7. John P. (Trey) Boggess (2021 Fall ~ 2023 Spring)
   Continued MS under my supervision.
8. Daniel Restrepo Tangarife (2020 Spring ~ 2021 Fall)
   Exchanging undergraduate research assistant from the Universidad Tecnológica de Pereira, Colombia.
9. William Caldbeck (2021 Summer)
   Awarded 2021 Engineering Summer Undergraduate Research Fellowship at the University of Kentucky.
10. William Plucknett (2020 Fall ~ 2021 Summer)
    Awarded 2021 ECE Undergraduate Research Fellowship at the University of Kentucky.
    Continued MS at the University of Michigan.
11. Benton Girdler (2020 Spring ~ 2021 Spring)
    Awarded 2021 NSF Graduate Research Fellowship.
    Continued PhD at the University of Chicago.

High School Research Supervisor

1. Sophie Agbekpenou (2021 Fall ~ 2022 Spring)
   Continued BS at Columbia University.

Service Activities

Community Service and Outreach Activities

- Exhibitor: Scientific Demonstration to Public at E-day (2020, 2021, 2024, 2025)
  College of Engineering, University of Kentucky.
  Title: Intelligent Machines and Brain.
- Presenter: Scientific Demonstration to preK-2 graders (2024)
  ReengKi English, Daegu, South Korea.
  Title: Brain Machine Interfaces.
- Exhibitor: Scientific Demonstration to Public at Curiosity Fair (2023)
  University of Kentucky Libraries.
  Title: Intelligent Machines and Brain.
- Interviewee: Local Radio Station (2020)
  WVLK, Lexington KY, USA.
  Topic: Trends and Research on Brain Machine Interfaces.
- Exhibitor: Scientific Demonstration to Public at Curiosity Fair (2019)
  University of Kentucky Libraries.
  Title: Intelligent Machines: Can Machines Be Smart?

International Level Service

- Guest Editor: Mathematics (2023 ~ 2025)
- Organizer: Neuro-Engineering Workshop with EEG-focused Brainstorm Training (2020) Workshop Webpage: http://neuroengworkshop.engr.uky.edu/

Local Level Service

- Treasurer: IEEE Lexington Section (2022 ~ Present)
- Organizer: Brainstorm Workshop in Miami (2014)
  Workshop Webpage: https://neuroimage.usc.edu/brainstorm/WorkshopMiami2014

University Level Service

- Interviewer: Department of Neurology Faculty Candidate Evaluation (2024)
- Participant: The Graduate Society of Women Engineer (GradSWE) Female Faculty-Student Mixer, University of Kentucky (Spring 2020)
- Judge: Poster Presentations at The McNair Scholars Research Conference, Florida International University (2018)
- Judge: Poster Presentations at the Advanced Research and Creativity in Honors (ARCH) Program, Florida International University (2014)

College Level Service

- Major of the Week Presentation (Electrical Engineering) for First Year Engineering Students (2024)
- Major of the Week Presentation (Computer Engineering) for First Year Engineering Students (2024)
- Panelist: Women in Engineering Evening, College of Engineering, University of Kentucky (2020, 2021, 2023)

Department Level Service

- ECE Assessment Committee (2024 ~ Present)
- ECE ABET Scoring Team SO5 (Teamwork) Committee (2020 ~ Present)

- ECE Lab Resource Committee: University of Kentucky (2023 ~ Present)
- CPE Faculty Search Committee: University of Kentucky (2023 ~ 2024)
- Judge: Poster Presentations at ECE Research Symposium, University of Kentucky (2020 ~ 2023)
- Judge: ECE Senior Design Projects, University of Kentucky (Fall 2019)
- Judge: Poster Presentations at The Annual Biomedical Engineering (BME) Undergraduate Research Day, Department of Biomedical Engineering, Florida International University (2018)
- Judge: Poster Presentations at the 4th Annual Biomedical Engineering (BME) Graduate Research Day, Department of Biomedical Engineering, Florida International University (2014)

Reviewer

Journal

- Pattern Recognition (2025)
- Biomedical Signal Processing and Control (2024)
- International Forum of Allergy & Rhinology (2024)
- BMC Medical Informatics and Decision Making (2023, 2024)
- Journal of Neuroscience Methods (2023)
- Frontiers in Neurorobotics (2023)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS) (2015 ~ 2021)
- Frontiers in Human Neuroscience (2020)
- Brain Informatics (2020)
- IEEE Transactions on Cybernetics (2016)
- Computer Vision and Image Understanding (CVIU) (2015)
- Frontiers in Neuroscience, Brain Imaging Methods (2014)
- Journal of Magnetics (JOM) (2012)

Conference Proceedings

- International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) (2023)
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP) (2018, 2021)
- American Society for Engineering Education (ASEE) (2018)
- Organization for Human Brain Mapping (OHBM) (2015)
- International Symposium on BIOMEDICAL IMAGING (ISBI) (2014)

Professional Membership

- ***Member of IEEE Honor Society Eta Kappa Nu*** (2024 ~ Present)
- ***Senior Member of IEEE*** (2024 ~ Present)
- Member of IEEE (2020 ~ Present)
- Member of Society for Neuroscience (SfN) (2014, 2019 ~ 2022, 2024 ~ Present)
- Member of Korean-American Scientists and Engineers Association (KSEA) (2014, 2020, 2024 ~ Present)
- Member of American Society of NeuroRadiology (ASNR) (2021 ~ 2022)
- Student Member of IEEE (2011)

Professional Development

- Participant: IEEE Southeast Con, Concord, NC (2025)
- Participant: Annual Meeting of Society of Neuroscience, Chicago, IL (2024)

- Participant: 2-day Virtual Seminar of NIH Grants Process Primer (2024)
- Participant: Virtual American Epilepsy Society First Time Attendee Orientation (2024)
- Participant: Annual Meeting of American Epilepsy Society, Los Angelas, CA (2024)
- Participant: American Epilepsy Society's Specific Aims Club, Los Angelas, CA (2024)
- Participant: 2023 Showcase of Undergraduate Scholars, University of Kentucky (2023)
- Participant: IEEE Section Congress, Ottawa, Canada (2023)
- Participant: Pre-Tenure Workshops by Dr. Mike Renfro, College of Engineering, University of Kentucky (2023)
- Participant: Pre-Tenure Workshops by Dr. Sue Nokes, College of Engineering, University of Kentucky (2019 ~ 2022)
- Participant: Neurology Grand Rounds, University of Kentucky (2022)
- Participant: Virtual National Effective Teaching Institute (NETI) 3C online workshop (2021)
- Selected Participant: Virtual NSF ENG CAREER Proposal Writing Workshop (2020)
- Selected Participant: The Professional Development Workshop (ProDeW) Held by Korean-American Scientists and Engineers Association (KSEA) Chicagoland, Chicago, IL (2014)