

KEVIN DAVIS

1600 NW 12st Miami, FL 33136 • (602) 384-4919 • kevin.davis@miami.edu

Education **University of Miami** *Miami, Florida*

2018-Present. Medical Scientist Training Program

Brigham Young University *Provo, Utah*

2009–2015. B.S. Neuroscience.

Research Experiences **University of Miami** *Miami, Florida*

2019–Present. Dr. Abhishek Prasad.

Application design for home-use modulation of brain-computer interface in a patient with Spinal Cord Injury

2018. Dr. Bradley Goldstein. Research Rotation

Time-course expression of CXCLR4 within murine olfactory epithelium after injury

2018. Dr. Monica Perez. Research Rotation

Modulation of spasticity through vibration and acute intermittent hypoxia

University of Iowa *Iowa City, Iowa*

2016–2018. Dr. Huxing Cui. Research Projects: Lateral hypothalamic regulation of blood pressure; behavioral and metabolic characterization of eating disorders associated with HDAC4^{A778T} mutation in mice

2015–2016. Dr. Andrew Pieper. Research Projects: Axonal degradation in mouse models of traumatic brain injury; neuroprotective properties of compound P7C3

Brigham Young University *Provo, Utah*

2013–2015. Dr. Steven Charles. Research Projects: Control of redundant movements of the wrist and forearm; minimum-jerk trajectories applied to rotational movements of the wrist

2014–2015. Dr. Jonathan Wisco. Research Project: Differences in putative pheromone-induced brain activity in male and female adults

Center for Sensorimotor Neural Engineering *Seattle, Washington*

2014. Dr. Kat Steele. Research Projects: Long-term electromyography gait analysis in patients with cerebral palsy

Publications **Published**

Cajigas, I., **Davis, K. C.**, Prints, W. P., Gallo, S., Naeem, J. A., Fisher, L., Ivan, M. E., Prasad, A., Jagid, J. R. (2023) Brain-Computer interface control of stepping from invasive electrocorticography upper-limb motor imagery in a patient with quadriplegia. *Frontiers in Human Neuroscience*, 16. <https://doi.org/10.3389/fnhum.2022.1077416>

Davis, K. C., Meschede-Krasa, B., Cajigas, I., Prins, N. W., Alver, C., Gallo, S., ... Prasad, A. (2022). Design-development of an at-home modular brain-computer interface (BCI) platform in a case study of cervical spinal cord injury. *Journal of NeuroEngineering and Rehabilitation*, 19(1), 53. <https://doi.org/10.1186/s12984-022-01026-2>

Davis, K. C. & Cajigas, I. Brain-Computer Interfaces for Spinal Cord Injury: Technology Progressing Toward a Clinical Reality. *SpineLine* (2022). Review

Cajigas, I., **Davis, K. C.**, Meschede-Krasa B. et al. Implantable brain-computer interface for neuroprosthetic-enabled volitional hand grasp restoration in spinal cord injury. *Brain Commun.* (2021) doi:10.1093/braincomms/fcab248.

Davis, K. C., Saito, K., Rodeghiero, S. R., Toth, B. A., Lutter, M., & Cui, H. (2020). Behavioral Alterations in Mice Carrying Homozygous HDAC4A778T Missense Mutation Associated With Eating Disorder. *Frontiers in Neuroscience*, 14. <https://doi.org/10.3389/fnins.2020.00139>

Saito, K., **Davis, K. C.**, Morgan, D. A., Toth, B. A., Jiang, J., Singh, U., ... Cui, H. (2019). Celastrol reduces obesity in MC4R deficiency and stimulates sympathetic nerve activity affecting metabolic and cardiovascular functions. *Diabetes*, 68(6), 1210–1220. <https://doi.org/10.2337/db18-1167>

- Dorman, G. R., **Davis, K. C.**, Peaden, A. W., & Charles, S. K. (2018). Control of redundant pointing movements involving the wrist and forearm. *Journal of Neurophysiology*, 120(4), 2138–2154. <https://doi.org/10.1152/jn.00449.2017>
- Lutter, M., Khan, M. Z., Satio, K., **Davis, K. C.**, Kidder, I. J., McDaniel, L., ... Cui, H. (2017). The Eating-Disorder Associated HDAC4A778T Mutation Alters Feeding Behaviors in Female Mice. *Biological Psychiatry*, 81(9). <https://doi.org/10.1016/j.biopsych.2016.09.024>
- Yin, T. C., Voorhees, J. R., Genova, R. M., **Davis, K. C.**, Madison, A. M., Britt, J. K., ... Pieper, A. A. (2016). Acute axonal degeneration drives development of cognitive, motor, and visual deficits after blast-mediated traumatic brain injury in mice. *ENeuro*, 3(5). <https://doi.org/10.1523/ENEURO.0220-16.2016>

Preprint

- Cui, H., Singh, U., Toth, B., Jiang, J., Dickey, J., Saito, **K.**, **Davis, K.**, Aklan, I., Yavuz, Y., Sayar-Atasoy, N., Li, R., Purnell, B., Mustafa O., Deng, G., Deng, Y., Kim, Y., Atasoy, D., Buchanan, G. (2024). Leptin engages the lateral hypothalamus to ventral tegmental area circuit to modulate sleep-wake behavior. Preprint. <https://doi.org/10.21203/rs.3.rs-3934916/v1>

Awards **Presentations & Fellowships**

2023. 1st Place Presentation. UM Neurosurgery Student Interest Group Symposium, Miami, FL
2022. 1st Place Poster Award. MSTP Research Symposium. Miami, FL.
2021. 2nd Place Poster Award. Neural Engineering Research Symposium. Miami, FL
2020. Lois Pope LIFE Fellowship Award. Miami, FL
2020. Outstanding Poster Award. Neural Engineering Research Symposium. Miami, FL
2020. 1st place MD/PhD Trainee Presentation. Eastern-Atlantic Student Research Forum. Miami, FL

Grants

2014. Brigham Young University Magnetic Resonance Imaging Research Facility Grant

Certificates

2022. g.tec BR41N Hackathon. Data processing challenge participant

Presentation & Abstracts

North American Neuromodulation Society

Orlando, FL

2025. Poster Presentation. Brain-Computer Interface Cervical Epidural Spinal Cord Stimulation for SCI motor Rehabilitation: A Clinical Experience. K. C. Davis, Z. Boogaart, R. A. Fadli, A. Sasaki, A. Yuasa, G. S. Piedade, S. Tigchelaar, J. R. Jagid, M. E. Ivan, A. Prasad, J. D. Guest, M. Capogrosso, M. Milosevic, J. G. Cordeiro

American Association of Neurological Surgeons

Chicago, IL

2024. Poster Presentation. Five-year performance analysis of a chronic fully-implanted ECoG-based BCI in an individual with tetraplegia. K. C. Davis, K. Wyse-Sookoo, F. Raza, B. Meschede-Krasa, N. W. Prins, L. Fisher, M. E. Ivan, A. Prasad, I. Cajigas, J. R. Jagid
2024. Poster Presentation. Developing a Real-Time Decoder for Bilateral Upper Extremity Motor Strip ECoG After Cervical Spinal Cord Injury Using Multi-Class Machine Learning Techniques. C. A. Rivera, K. C. Davis, D. Levi, I. Cajigas, N. W. Prins, S. Galo, J. Naeem, M. E. Ivan, A. Prasad, J. R. Jagid

Miami Project Lecture Series

Miami, FL

2024. Lecture. Development of an At-Home Brain-Computer Interface in a Case Study of Cervical Spinal Cord Injury

IEEE NER Conference

Baltimore, MD

2023. Poster Presentation. Motor Reanimation in a Case of Cervical Spinal Cord Injury using Upper-Limb Motor-Imagery based Electro-corticography Brain-Computer Interface. K. C. Davis, I. Cajigas, B.

Meschede-Krasa, N. W. Prins, C. Alver, S. Gallo, S. Bhatia, J. H. Abel, J. Naeem, L. Fisher, M. Morrison, W. R. Rifai, M. E. Ivan, E. N. Brown, J. R. Jagid, A. Prasad

UM NSIG Research Symposium

Miami, FL

2023. Oral Presentation. Reliability of electrocorticography-based motor brain-computer interface 4 years post implantation. K. C. Davis, K. Wyse-Sookoo, I. Cajigas, B. Meschede-Krasa, N. W. Prins, S. Gallo, J. A. Naeem, S. Bhatia, L. Fisher, D. W. Dietrich, M. E. Ivan, A. Prasad, J. R. Jagid

Miami MSTP Research Symposium

Miami, FL

2022. Poster Presentation. Real-Time Classification of Binary Motor Imagery from Electroencephalography Signals in Individuals with Spinal Cord Injury. K. C. Davis, B. Meschede-Krasa, S. Guerra, K. Gant, N. W. Prins, A. Prasad

Eastern-Atlantic Student Research Forum

Miami, FL

2022. Poster Presentation. Bilateral representation of hand grasp motor imagery from ECoG recordings of the dominant cerebral hemisphere.. K. C. Davis, J. S. Naeem, I. Cajigas, C. Alver, S. Gallo, N. W. Prins, M. E. Ivan, J. R. Jagid, A. Prasad

American Association of Neurological Surgeons

Orlando, FL

2021. Oral Presentation. Patient-operated Brain-Computer Interface for Hand Grasp Restoration at Home. K. C. Davis, B. Meschede-Krasa, S. Gallo, S. Bhatia, J. H. Abel, N. W. Prins, M. E. Ivan, A. Prasad, J. Jagid, E. N. Brown, I. Cajigas

Graduate Research Symposium

Miami, Florida

2021. Poster Presentation. Towards Restoring Independence: Building a Brain-Computer Interface for use at Home for a subject with Spinal Cord Injury. K. C. Davis, B. Meschede-Krasa, S. Bhatia, W. R. Rafai, M. Morrison, F. Raza, S. Gallo, J. H. Abel, N. W. Prins, M. E. Ivan, E. N. Brown, J. Jagid, I. Cajigas, A. Prasad

Community Health Leadership Conference

Miami, Florida

2021. Poster Presentation. Utilizing Version Control Through GitHub for Maintaining Quality Control of a REDCap Electronic Health Record System. K. C. Davis, J. Hunter, A. R. Deshpande

Clinical Neurosurgery

Miami, Florida

2020. A Modular Brain-Computer Interface that Restores Hand Grasp Designed for Independent, At-Home Use. Davis, K., Meschede-Krasa, B., Alver, C., Gallo, S., Batia, S., Abel, J., ... & Cajigas, I. (2020), 67(Supplement_1), nyaa447_627.

Neural Engineering Research Symposium

Miami, Florida

2020. Poster Presentation. A Modular Brain-Computer Interface for Restoring Hand Grasp at Home. K. C. Davis, B. Meschede-Krasa, C. Alver, S. Gallo, S. Bhatia, J. H. Abel, J. Tauber, I. C. Garwood, N. W. Prins, M. E. Ivan, A. Prasad, J. Jagid, E. N. Brown, I. Cajigas

Eastern-Atlantic Student Research Forum

Miami, Florida

2020. Poster Presentation. Behavioral Alterations in homozygous HDAC4A778T mice with eating disorder. K.C. Davis, K. Saito. S. R. Rodeghiero. H. Cui.

Diabetes Research Week

Iowa City, Iowa

2018. Poster Presentation. Celastrol reduces obesity in MC4R deficiency and stimulates sympathetic nerve activity affecting cardiovascular function. K. C. Davis, K. Siato, D. Morgan, B. A. Toth, H. Cui

Society for Neuroscience 2017

Washington D.C.

2017. Poster Presentation. Behavioral and metabolic characterization of eating disorder associated HDAC4-A778-T mutant mice. K.C. Davis, S. R. Rodeghiero, K. Saito, B. A. Ahlers, H. Cui.

Iowa Research Week *Iowa City, Iowa*
2017. Poster Presentation. Anti-obesity effect of celastrol requires leptin signaling but is independent of the central melanocortin system. K. C. Davis, K. Saito, E. N. Rodriguez, B. Toth, E. Martinez, H. Cui

Pharmacology Retreat *Coralville, Iowa*
2016. Poster Presentation. Characterization of the HDAC4^{A778T} Mouse. K. C. Davis, M. Z. Khan, L. McDaniel, B. W. Darbro, A. A. Pieper, M. Lutter, H. Cui.

UW Research Symposium *Seattle, Washington*
2014. Poster Presentation. Long-Term acquisition of EEG signals in daily activities. K. C. Davis. B. Shuman, K. Rumberger, K. M. Steele.

Utah Neuroscience Symposium *Snowbird, Utah*
2013. Poster Presentation. Control of redundant wrist movements. G. M. Dorman, K. C. Davis, A. W. Peadan, S. K. Charles

Relevant Coursework **2022. g.tec Brain-Computer Interface Spring School** *Vienna, Austria (Virtual)*
10 day-130 hour crash course covering topics in BCIs with EEG and other biosignals, neuromodulation, deep brain stimulation, gaming, brain assessment, closed loop experiments with TMS and tDCS, deep learning, communication, rehabilitation, functional mapping, programming, high altitude and sports medicine, neuromarketing, hacking, and exoskeletons.

2021. National Center for Adaptive Neurotechnologies *Rochester, New York (Virtual)*
Scientific and Engineering Principles of Adaptive Neurotechnologies. Course included a comprehensive grasp of the basic theory and practice of adaptive neurotechnologies; An understanding of the scientific and clinical potential of these technologies; and exposure to the practical application of adaptive neurotechnologies to real-world problems.

Teaching Experiences **University of Miami** *Miami, Florida*
2023 Dr. Jared Lippmann. BME 401 Biomedical Design. Circuit design and microcontroller programming consultant
2020-2023 Dr. Thomas Champney. MBS 605 Gross Anatomy & Histology. Teaching assistant
2019 Dr. Thomas Champney. MDR 504 Human Structure Anatomy. Head anatomy teaching assistant

Brigham Young University *Provo, Utah*
2013-2015. Dr. Jonathan Wisco. Elementary Anatomy Laboratory Teaching Assistant

University of Utah *Salt Lake City, Utah*
2014. Dr. Jonathan Wisco. University of Utah School of Medicine anatomy laboratory short-term teaching assistant

Volunteer Service **University of Miami DOCS** *Miami, Florida*
2020-Present. DOCS Medical Informatics Consultant
2019-2020. DOCS Medical Informatics Project Manager
2018-2019. DOCS Medical Informatics Assistant Station Manager

Iowa City Free Medical Clinic *Iowa City, Iowa*
2016-2018. Supervisor: Jennifer Beltran. Patient guide

University of Iowa Hospitals and Clinics *Iowa City, Iowa*
2016. Supervisor: Jaison Marks. Second stage recovery
2015. Supervisor: Jaison Marks. Orthopedic Clinic

Habitat for Humanity *Iowa City, Iowa*

2015–2016. Local community builds

Conversation Partners

Iowa City, Iowa

2015–2016. Korean Conversation Partner

Horizon Hospice Services

Provo, Utah

2015. Supervisor: Tracy Ruiz

Utah Valley Regional Hospital

Provo, Utah

2015. Supervisor: Cheryl Call. Emergency Department

2013. Neuro shock trauma and Intensive care unit

Utah Special Olympics

Provo, Utah

2013–2014. Supervisor: Michael Blomfield. Basketball. Soccer. Softball

The Church of Jesus Christ of Latter-Day Saints

Hungary

2010–2012. Mission President: Gary S. Baughman. Leadership Roles: Assistant to the President

Previous Employment

Brigham Young University Print and Mail Services

Provo, Utah

2012–2013. Employer: Zack Cameron. Junior Web and Software Developer

Devila Web Design

Phoenix, Arizona

2007–2009. Employer: Ricardo Devila. Freelance Web Developer

Suddenly Slimmer Day Spa

Phoenix, Arizona

2007–2009. Employer: Luzivone Damaceno. Web Developer and Database administrator.

Technical Skills

Life Sciences

EEG, ECoG, spatial-temporal dynamic analysis. Time-series prediction. PCR/qPCR, Western Blot, Immunohistochemistry, Mouse dissection, Mouse Stereotaxic Surgery, Optogenetics, Behavioral Assays

Computational

Programming Languages: Python, C/C++, Bash, NodeJS, R, TypeScript, JavaScript, NativeScript, HTML, (S)CSS, MatLab, Assembly. Familiar with Lua, Swift/SwiftUI, PHP, SQL

Technical Frameworks: HTTP/TCP/IP Networking, Familiar with Deep Learning with TensorFlow and PyTorch, Microcontroller programming (Arduino, Zephyr), Circuit Design,

Software

Microsoft Office, LaTeX, Pandoc, GraphPad Prism, Autodesk Eagle Fusion 360