

Curriculum Vitae and Bibliography

Kai Joshua Miller, MD, PhD

Personal Information

Place of Birth: California
Work Address: Mayo Clinic
200 First Street SW
Rochester, MN 55905
Email Address: Miller.Kai@mayo.edu

Present Academic Rank and Position

Full Faculty Privileges in Neuroscience - Mayo Clinic Graduate School of Biomedical Sciences, Mayo Clinic College of Medicine and Science 03/29/2021 - Present
Consultant - Department of Neurologic Surgery, Mayo Clinic, Rochester, Minnesota 06/22/2022 - Present
Associate Professor of Pediatrics - Mayo Clinic College of Medicine and Science 05/01/2023 - Present
Associate Professor of Biomedical Engineering - Mayo Clinic College of Medicine and Science 07/01/2023 - Present
Professor of Neurosurgery - Mayo Clinic College of Medicine and Science 06/01/2024 - Present

Education

University of California San Diego, San Diego, California - BS, Physics and Biology 1996 - 2000
University of Washington, Seattle, Washington - MS, Physics 2000 - 2006
University of Washington, Seattle, Washington - PhD, Physics, Thesis: Characteristic changes in electrocorticographic power spectra of the human brain. Thesis Advisor: Marcel denNijs. 2000 - 2008
University of Washington, Seattle, Washington - MD, Primary Mentor: Jeffrey G. Ojemann 2000 - 2011
University of Washington, Seattle, Washington - PhD, Neurobiology and Behavior, Thesis: The dynamics of category-specific perception in ventral temporal cortex, Thesis Advisor: Rajesh P. N. Rao. 2007 - 2014
Stanford University, Stanford, California - Resident, Department of Neurosurgery; Chairman: Gary K. Steinberg; Program Director: Griffith Harsh. Clinical and Research Mentors: Gerald Grant, Griffith Harsh, and Casey Halpern. 2011 - 2018
Stanford University, Stanford, California - Fellowship, Stereotactic & Functional Neurosurgery 2014 - 2015
UMC Utrecht, Brain Center Rudolf Magnus, Department of Neurology and Neurosurgery, Utrecht, Netherlands - Fellowship, Surgical Fellowship in Eloquent Cortex Tumors and Awake Mapping 2015 - 2016
Wilhelmina Kinderziekenhuis (Children's Hospital), Utrecht, Utrecht, Netherlands - Fellowship, Pediatric Neurosurgery & Epilepsy 2018 - 2019

Certification

Other Certifications

Mayo Clinic Quality Academy

Mayo Clinic Quality Fellow: Bronze Level Certification 2020

Honors and Awards

National Merit Scholar - National Merit Scholarship Corporation 1996 - 2000
Regent Scholar - University of California 1996 - 2000
Provost's Scholar - University of California, San Diego 1998

NASA Research Fellow - Johnson Space Center	1999
Medical Scientist Training Program - NIH	2000 - 2011
Balfour Fellow - Sigma Chi Fraternity	2000 - 2001
Poncin Fellowship Award - Poncin Foundation	2004 - 2007
Neurological Surgery Training Grant - NIH	2006
NASA Graduate Student Researchers Project - NASA - Johnson Space Center	2009 - 2011
Daniel H. Cannon Leadership Award - Phi Chi Medical Fraternity	2010
Kaiser Award - San Francisco Neurological Society	2012
Newman Award - San Francisco Neurological Society	2013
Annual BCI Research Award Finalist - BCI Award Foundation	2014
Distinguished Scholar - National Center for Adaptive Neurotechnologies (NCAN)	2014
Boldrey Award - San Francisco Neurological Society	2015
Stanford Society of Physician Scholars Award Recipient - Stanford School of Medicine	2016
Van Wagenen Fellowship - Van Wagenen Society	2018
Rosegay Award - San Francisco Neurological Society	2018

Previous Professional Positions and Major Appointments

Research Assistant - California Space Institute at UCSD, San Diego, California Departments of Immunology. Advisors: David Kleinfeld, Greg Silverman, Michael Wiskerchian.	1997 - 1998
Research Assistant - California Space Institute at UCSD, San Diego, California Departments of Physics. Advisors: David Kleinfeld, Greg Silverman, Michael Wiskerchian.	1998 - 2000
Research Assistant - NASA, Johnson Space Center, Houston, Texas Environmental Physiology Lab. Advisors: Michael Gernhardt and Michael Powell (1999).	1999
Research Assistant - University of Washington, Harborview Hospital, Seattle, Washington Neural Systems Laboratory. Advisors: Marcel denNijs, Rajesh P. N. Rao, Jeffrey G. Ojemann.	2000 - 2011
Visiting Scientist - University Medical Center Utrecht, Utrecht, Netherlands Department of Neurology and Neurosurgery, Rudolf Magnus Institute of Neuroscience. Advisor: Nick Ramsey	2008
Research Assistant - NASA, Johnson Space Center, Houston, Texas Environmental Physiology Lab.	2009 - 2011
Enfolded Surgical Fellowship - Stanford University, Stanford, California Functional Neurosurgery. Mentor: Casey Halpern.	2014 - 2015
Enfolded Surgical Fellowship - University Medical Center, Utrecht, Netherlands Eloquent Cortex Tumors and Awake Mapping. Mentor: Pierre Robe.	2015 - 2016
Van Wagenen Fellowship - UMC Utrecht, Utrecht, Netherlands My fellowship will be spent at UMC Utrecht in Netherlands and will focus on understanding network neurophysiology for implanted closed-loop brain computer interfaces (BCIs), while learning operative techniques for Epilepsy surgery in adult and pediatric patients. Advisors: Nick Ramsey, Peter van Rijen, Pierre Robe	2018 - 2019
Supplemental - Department of Neurologic Surgery, Mayo Clinic, Rochester, Minnesota	08/29/2018 - 06/30/2019
Assistant Professor of Neurosurgery - Mayo Clinic College of Medicine and	10/01/2018 - 02/28/2022

Science

Assistant Professor of Biomedical Engineering - Mayo Clinic College of Medicine and Science	12/01/2018 - 06/30/2023
Senior Associate Consultant - Department of Neurologic Surgery, Mayo Clinic, Rochester, Minnesota	07/01/2019 - 06/21/2022
Assistant Professor of Pediatrics - Mayo Clinic College of Medicine and Science	09/01/2019 - 04/30/2023
Teaching/Examining Privileges of Neuroscience - Mayo Clinic Graduate School of Biomedical Sciences, Mayo Clinic College of Medicine and Science	12/09/2019 - 03/28/2021
Associate Professor of Neurosurgery - Mayo Clinic College of Medicine and Science	03/01/2022 - 05/31/2024

Professional Memberships and Societies

Professional Memberships and Services

American Association of Neurological Surgeons (AANS) Member	2011 - Present
American Physiological Society Member	2015 - Present
Brain-Computer Interface (BCI) Society Founding Member	2016 - Present
Congress of Neurological Surgery Member	2011 - Present
IEEE Member	2005 - Present
Phi Chi Medical Fraternity, Epsilon Kappa Chapter Member of the National Welfare Board	2004
Member of the National Welfare Board	2005
Executive Member-at-Large of the National Welfare Board	2006
Executive Member-at-Large of the National Welfare Board	2007
Executive Member-at-Large of the National Welfare Board	2008
Member of the National Welfare Board	2009
Member of the National Welfare Board	2010
Sigma Chi Fraternity, Iota Chi Chapter Academic Advisor to Upsilon Upsilon Chapter	2000 - 2001
Member	2000 - 2001
Society for Neuroscience Member	2004 - Present
University of Washington, Graduate Student Senate Senator from the Physics Department	2003 - 2004

Journal Responsibilities

Journal Editorial Responsibilities

Cerebral Cortex Reviewer	2010 - Present
Frontiers in Human Neuroscience Reviewer	2009 - Present
Associate Editor	2010
Hippocampus Reviewer	2008 - Present

Human Brain Mapping Reviewer	2007 - Present
IEEE Eng Med Biol Soc Reviewer	2005 - Present
IEEE Transactions on Biomedical Engineering Reviewer	2007 - Present
IEEE Transactions on Neural Systems and Rehabilitation Engineering Reviewer	2009 - Present
International Journal of Computer Assisted Radiology and Surgery Reviewer	2010 - Present
Journal of Neural Engineering Reviewer	2010 - Present
Journal of Neuroscience Reviewer	2008 - 2016
Journal of Neuroscience Methods Reviewer	2008 - Present
Neural Information Processing Systems (NIPS) Reviewer	2006 - 2008
NeuroImage Reviewer	2007 - Present
Neuroprosthetics Associate Editor	2016 - Present
PLOS Biology Reviewer	2013 - Present
PLOS Computational Biology Reviewer Guest Editor	2010 - Present 2013 - 2014
Plos One Reviewer	2011 - Present
PRESENCE Reviewer	2009 - Present
Proceedings of the National Academy of Sciences (PNAS) of the USA Reviewer	2011 - Present
Trends in Cognitive Sciences Reviewer	2009 - Present

Journal Other Responsibilities

International BCI Chair (Annual BCI Award (2018), Presented at 7th International BCI meeting, Asilomar, CA,)	05/23/2018 - Present
International Workshop Moderator ("An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans: innovation and challenges in closed-loop neuromodulation",)	08/24/2023 - 08/25/2023
Society for Neuroscience Scientific Reviewer (Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting, San Diego, CA,)	11/11/2016 - Present

Education Interests and Accomplishments

Teaching

Physics 1B: 2nd Quarter Introductory Physics. Teaching Assistant University of California San Diego, California	01/2000 - 03/2000
Physics 428A: The Physics of Biological Vision. Teaching Assistant University of Washington Seattle, Washington	06/2001 - 08/2001
Minority Medical Education Program: Introductory Physics Course Instructor University of Washington Seattle, Washington	06/2002 - 08/2002
Minority Medical Education Program: Introductory Physics Course Instructor University of Washington Seattle, Washington	06/2003 - 08/2003
CSE 590RR: Introduction to Computational Neuroscience. Teaching Assistant University of Washington Seattle, Washington	09/2003 - 12/2003
CSE 590RR: Introduction to Computational Neuroscience. Poisson Statistics and Stochasticity in Neuronal Spike Timing. Guest Lecturer University of Washington Seattle, Washington	10/2003
Minority Medical Education Program: Introductory Physics Course Instructor University of Washington Seattle, Washington	06/2004 - 08/2004
Realtime Classification of Electromyogram for Robotic Arm Control. Demonstration by Crawford B, Miller KJ, Shenoy P, Rao R Neural Information Processing Systems Vancouver, British Columbia, Canada	12/2004
CSE/NEUBEH 528: Computational Neuroscience. Compartmental Models for Potential Propagation. Guest Lecturer University of Washington Seattle, Washington	01/2005 - 02/2005
CSE/NEUBEH 528: Computational Neuroscience. Teaching Assistant University of Washington Seattle, Washington	01/2005 - 03/2005
Cogs160: Brain Computer Interfaces. Electrographic Brain Computer Interfaces. Guest Lecturer University of California San Diego, California	06/2005 - 08/2005
CSE 599E: Brain Computer Interfaces. Using Electrographic Motor Signals for Device Control. Guest Lecturer University of Washington Seattle, Washington	03/2006 - 05/2006
CSE490I: Neurobotics. Translating Brain Signals. Guest Lecturer University of Washington Seattle, Washington	01/2007 - 03/2007

BIOEN 302: Introduction to Biomedical Instrumentation. Electrocorticographic Measurement and Experiment. Guest Lecturer University of Washington Seattle, Washington	10/2007 - 12/2007
CSE 591B: Electrocorticographic methods Course Instructor University of Washington Seattle, Washington	04/2008 - 05/2008
HUBIO 532: P-Nervous System (Medical School Neuroanatomy) Teaching Assistant University of Washington Seattle, Washington	04/2008 - 06/2008
Cogs160: Brain Computer Interfaces. Capturing Brain Surface Electrical Potentials for Application and Intuition. Guest Lecturer University of California San Diego, California	06/2009 - 08/2009
Training course at the Center for Neural Communication Technology: Implantable Neuroprosthetics: Technologies & Techniques. Guest Lecturer University of Michigan Ann Arbor, Michigan	05/2010
National Science Foundation Brain-computer interface graduate student training course. An introduction to neurobiology for BCI signal acquisition. Guest Lecturer Asilomar, California	06/2010
Decoding Brain Signals. Co-Host Microsoft Competition Asilomar, California	03/2016 - 06/2016
Neuromodulation and Stereotaxy in Neurosurgery Academic Grand Rounds	02/2020
“Neurophysiological Techniques for Basal Ganglia and Thalamic Mapping”, AANS/ASSFN/NREF Stereotactic and Functional Hands-On Course / Workshop, Denver, Colorado,	11/2021 - Present
“Neurophysiological Techniques for Basal Ganglia and Thalamic Mapping AANS/ASSFN/NREF Stereotactic and Functional Hands-On Course / Workshop, Denver, Colorado,	11/2022 - Present
“LITT Amygdalohippo-campectomy, Stereotactic Planning and Approach” Rhoton-de Oliveira Stereotactic Functional Neuroanatomy Applied to Movement Disorders, Epilepsy, and Pain 2023, Jacksonville, FL,	03/2023 - Present
“Rhythmic entrainment in cortical dynamics” gTec Spring School 2023 (Virtual),	04/2023 - Present
“Evolving strategies for stimulation in epilepsy” Mayo Clinic Stimulation Therapies for Epilepsy 2023, Rochester, MN,	09/2023 - Present
“DBS for Parkinson’s Disease” Pre-meeting movement workshop - Mayo Clinic Stimulation Therapies for Epilepsy 2023, Rochester, MN,	09/2023 - Present
“Movement-Associated Changes in ECoG” gTec ECoG MASTERCLASS 2023 (Virtual),	09/2023 - Present
“Awake DBS with Microelectrode Recording” Lecture at Stereotactic and Functional Neurosurgery Course, Denver, CO,	11/2023 - Present
“Surgical Decision Making in Epilepsy Surgery” Lecture at Stereotactic and Functional Neurosurgery Course, Denver, CO	11/2023 - Present
“Principles of stereotaxy and sources of stereotactic error”	11/2023 - Present

Lecture at Stereotactic and Functional Neurosurgery Course, Denver, CO

Mentorship

Chang, Brian (Undergraduate Student)	01/2003 - 12/2004
Description: Undergraduate student, CSE. Research Topic: Classifier Based EMG systems.	
Current Status:	
Outcome:	
Crawford, Beau (Undergraduate Student)	01/2003 - 12/2005
Description: Undergraduate student, CSE. Research Topic: Brain-Computer Interfaces and Classifier Based EMG systems.	
Current Status:	
Outcome:	
Evans, Nathan (Baccalaureate Student)	01/2005 - 12/2006
Description: Post Baccalaureate student, CSE. Research Topic: Brain-Computer Interfaces.	
Current Status:	
Outcome:	
Abel, Taylor (Medical Student)	01/2007 - 12/2010
Description: Research Topic: Language Studies in Electroconvulsive Therapy	
Current Status:	
Outcome:	
Blakeley, Tim (Graduate Student)	01/2007 - 12/2010
Description: Graduate Student (Bioengineering). Research Topic: Electroconvulsive Therapy for feedback and brain mapping	
Current Status:	
Outcome:	
Loya, Joshua (Medical Student)	01/2014 - 12/2015
Description: Research Topic: Fractal dimensionality in pediatric brain tumors	
Current Status:	
Outcome:	
Ali, Rohaid (Medical Student)	01/2015 - Present
Description: Research Topic: Fractal dimensionality in pediatric brain tumors	
Current Status:	
Outcome:	
Ojeda-Valencia, Gabriela	01/2020 - Present
Description: Research Topic: DBS electrophysiology	
Current Status:	
Outcome:	
Kleverink, Vita	01/2020 - 01/2021
Description:	
Current Status: Medical student	
Outcome:	
Huang, Harvey	01/2021 - Present
Description: Research Topic: Human ventral temporal electrophysiology.	
Current Status:	
Outcome:	
Jensen, Michael	01/2021 - Present
Description:	
Current Status: PhD Candidate, Mayo MSTP	
Outcome:	
Kerezoudis, Panagiotis	01/2021 - Present
Description:	
Current Status: PhD Candidate, Neurosurgery Resident	
Outcome:	
Alan, Albert	01/2021 - 01/2022
Description:	
Current Status: medical student	

Outcome:

Botello, Edgar

01/2021 - 01/2022

Description:**Current Status:** medical student**Outcome:**

Van Den Boom, Max

01/2022 - 01/2023

Description:**Current Status:** post-doctoral fellow**Outcome:**

Baker, Matthew

01/2023 - Present

Description:**Current Status:** Post-Doctoral Fellow**Outcome:****Academic Career Development**

Trauma and Functional Neurosurgery

08/30/2015 - 09/03/2015

2015 European Association of Neurological Societies Training Course
Lisbon, Portugal5th Annual World Course in Advanced Techniques in Neurosurgical Oncology
London, England, United Kingdom

06/22/2016 - 06/26/2016

AANS/ASSFN/NREF Stereotactic and Functional Neurosurgery Hands-on
Workshop
Aurora, Colorado

11/04/2016 - 11/06/2016

Scientific Chair: 10th Intl. Workshop on Electrocorticography at Society for
Neuroscience Meeting.
San Diego, California

11/11/2016 - Present

How to safely operate: In, through, and around the Cavernous Sinus.
Arkansas Neurosciences Institute
Little Rock, Arkansas

10/13/2017 - 10/16/2017

Presentations Extramural**National or International****Invited**The peaks and the power laws in the cortical spectrum.
Large Scale Brain Dynamics Symposium
Whistler, British Columbia, Canada

12/07/2007

Large Scale Brain Dynamics.
Organizer, Moderators: Kai J. Miller, Ryan Canolty
Symposium in Whistler
Whistler, British Columbia, Canada

12/07/2007 - 12/08/2007

The consequences of brain rhythms in the organization of neuronal computation.
Organizer, Moderators: Kai J. Miller, Thilo Womelsdorf
Workshop in Snowbird
Snowbird, Utah

03/02/2009

Developing simplified algebras to describe large-scale brain dynamics.
Organizer, Moderators: Kai J. Miller, Thilo Womelsdorf
Workshop in Snowbird
Snowbird, Utah

02/28/2011 - 03/01/2011

A template-projection approach to decode higher-order vision in realtime and at the
perceptual threshold.

01/09/2017

Invited Keynote.

The 5th International Winter Conference on Brain-Computer Interface (IEEE).
Seoul, South KoreaDecoding face perception from the ventral temporal lobe.
Invited Keynote.

01/09/2017

The 5th International Winter Conference on Brain-Computer Interface (IEEE). Seoul, South Korea	
Decoding face perception from the ventral temporal lobe. Invited Keynote. Neurosurgery in the Rockies, Translational Symposium on BCIs Colorado	02/25/2017
Brain dynamics of the human electrocorticogram. Invited Keynote. The 4th CiNet Conference Osaka, Japan	02/28/2018
Novel electrophysiological biomarkers and active obsession-provocation in the ventral striatum during awake OCD DBS Minnesota Neurosurgical Society Annual Meeting,	04/27/2019
Thulium laser tissue ablation for endoscopic third ventriculostomy Minnesota Neurosurgical Society Annual Meeting, Minneapolis, MN	04/27/2019
The electrophysiology of a human obsession in nucleus accumbens The 4th SNUH-Mayo Clinic Joint Symposium,	06/01/2019
Hippocampal stereotaxy: A novel mesial temporal stereotactic coordinate system WSSFN 2019, New York, NY	06/24/2019
The relevance of microcircuitry in nucleus accumbens DBS for OCD WSSFN 2019, New York, NY	06/24/2019
The Van Wagenen Fellowship: My year in Utrecht as the 50th fellow Hanbery Society Meeting, Deer Valley Utah,	07/01/2019
Large Scale Brain dynamics: developments in mapping and decoding Neurosurgery Grand Rounds, Mayo Jacksonville,	07/29/2019
An introduction to some signal processing concepts for the project Foundation for OCD Research Annual meeting, San Francisco, CA,	08/01/2019
Electrocorticography from motor cortex, and emerging directions for BCI Medtronic, Minneapolis,	08/16/2019
Some uses for a next-generation platform Visit to Boston Sci, Valencia	10/01/2019
(Electrocorticographic) BCI: Past, Present, and Future Congress of Neurological Surgery, San Francisco, CA,	10/19/2019
The Large-Scale Brain Dynamics of Human Motor Cortex, and Their Relevance to Movement Disorders Neurology Grand Rounds, Mayo Clinic Rochester,	11/04/2019
Human Motor Cortical Activity Is Selectively Phase-Entrained on Underlying Rhythms University of Minnesota, Neural Engineering Colloquium,	02/20/2020
Rhythmic entertainment in cortical dynamics cortiQ Virtual Meeting	04/16/2020
Electrocorticographic BCI Engineering in Medicine and Biology Conference (virtual),	06/20/2020
The Electrophysiology of an Obsession in Nucleus Accumbens 2020 Hai River Young Neurosurgeon's International Forum, (Virtual),	07/04/2020
Basis profile curve identification to understand electrical stimulation effects in human brain networks American Academy of Neurological Surgery (Virtual),	09/01/2020
Uncovering projections to motor cortex using single-pulse electrical stimulation University of Houston, BME Colloquium (Virtual),	11/01/2020

Basis profile curve identification to understand electrical stimulation effects in human brain networks Association for Clinical and Translational Science - Translational Science 2021: Connecting Virtually, Impacting Reality (Virtual),	03/01/2021
Rhythmic entrainment in the electrocorticogram as a closed-loop biomarker IEEE Neural Engineering Annual Meeting (Virtual),	05/06/2021
Decision making in Stereotactic Pediatric Epilepsy Surgery European Association of Neurosurgical Societies (EANS) - Young Neurosurgeons Society (Virtual)	06/01/2021
Electrocorticographic BCI from the motor system Brain Computer Interface Society (Virtual),	06/08/2021
My role on the team in support of Dr. Halpern Foundation for OCD Research Annual meeting, Santa Monica, CA,	08/16/2021
Targeting the initiation and circuit propagation of seizures with implanted stimulators DBS Think Tank, Orlando , FL,	08/26/2021
Surgical Decision making in Extratemporal Epilepsy Epilepsy and EEG in Clinical Practice 2021 (Virtual)	10/01/2021
Basis profile curve identification to understand electrical stimulation effects in human brain networks Society for Neuroscience Annual Meeting (Virtual),	11/01/2021
NEUROPHYSIOLOGICAL TECHNIQUES FOR BASAL GANGLIA AND THALAMIC MAPPING Lecture at Stereotactic and Functional Neurosurgery Course, Denver, CO,	11/15/2021
Ablation & stimulation: StereoEEG beyond resection guidance American Society for Pediatric Neurosurgery, Oahu, HI	02/01/2022
The Van Wagenen Fellowship: My year in Utrecht as the 50th fellow Meeting of the Van Wagenen Society at the American Association of Neurological Surgeons Annual Meeting, Philadelphia, PA,	04/01/2022
A new set of paradigms and machine learning algorithms to understand single-pulse electrical stimulation in the human brain Symposium at TU - Berlin, Berlin, Germany	06/01/2022
Targeting the initiation and circuit propagation of seizures with implanted stimulators Uitnodiging afscheidssymposium Dr. Peter van Rijen, Utrecht, The Netherlands,	06/03/2022
Basis Profile Curve Identification to Understand Electrical Stimulation Effects in Human Brain Networks Mayo Clinic Neuroscience Convergence, Orlando FL (Virtual presentation),	06/04/2022
Basis Profile Curve Identification to understand Electrical Stimulation Effects in Human Brain Networks Workshop on Brain Evoked Potentials in the Context of Neurosurgery, Montpellier, France	06/08/2022
Decision making in Stereotactic Pediatric Epilepsy Surgery Hanbery Society Meeting, Oahu, HI	07/01/2022
Decision making in Stereotactic Epilepsy Surgery World Society for Stereotactic and Functional Neurosurgery BiAnnual Meeting, Seoul/Incheon, Korea,	09/01/2022
Evolving decision making in stimulation therapy for epilepsy, World Society for Stereotactic and Functional Neurosurgery BiAnnual Meeting, Seoul/Incheon, Korea,	09/01/2022
Quantifying the structure of responses to single-pulse intracranial electrical brain stimulation Foundation for OCD Research Annual meeting, Santa Monica, CA,	09/01/2022

Future Stimulation for Epilepsy: Strategies for leveraging a new generation of IPGs and scientific inquiry in the treatment of epilepsy Mayo Clinic Stimulation Therapies for Epilepsy, Rochester, MN	10/01/2022
Stereotactic Intervention for Tumor Diagnosis and Therapy: Biopsy + Laser Ablation Mayo Clinic Pediatric Neuro-Oncology Symposium, Rochester, MN,	10/15/2022
Advanced Strategies for Epileptic and Tumor Targets: Minimally invasive disconnection surgery: Corpus callosotomy Medtronic online medical education series (unpaid),	11/01/2022
Canonical Response Parameterization: Quantifying the structure of responses to single-pulse intracranial electrical brain stimulation Society for Neuroscience Annual Meeting, San Diego, CA,	11/01/2022
NEUROPHYSIOLOGICAL TECHNIQUES FOR BASAL GANGLIA AND THALAMIC MAPPING Lecture at Stereotactic and Functional Neurosurgery Course, Denver, CO,	11/01/2022
Electrocorticography-based brain-computer interfaces 29th Annual Scientific Meeting of the Hong Kong Neurosurgical Society (Virtual)	11/09/2022
Automated Trajectory Planning for Stereo-Electroencephalography North American Neuromodulation Society Annual Meeting, Las Vegas, NV	01/13/2023
A Standardized Approach to MRI-guided Stereotactic Laser Corpus Callosotomy: Technical Description and Pediatric Case Series American Society for Pediatric Neurosurgery, San Juan, Puerto Rico,	02/02/2023
New Stragies for Circuit-Based Stimulation In Epilepsy: Strategies for leveraging a new generation of IPGs and building scientific tools for the treatment of epilepsy The Winter Clinics for Cranial & Spinal Surgery, Snowmass, CO,	03/01/2023
Amygdalohippo-campectomy, Stereotactic Planning and Approach Rhoton-de Oliveira Stereotactic Functional Neuroanatomy Applied to Movement Disorders, Epilepsy, and Pain 2023, Jacksonville, FL	03/16/2023
Awake DBS with Microelectrode Recording Stereotactic and Functional Neurosurgery Course, Portland, OR,	04/01/2023
Rhythmic entrainment in cortical dynamics gTec Spring School 2023 (Virtual),	04/18/2023
SEEG Recording from the Central Sulcus American Association of Neurological Surgeons Annual Meeting, Los Angeles, CA,	04/23/2023
An association area in the depths of the central sulcus Annual Meeting of the NIH Brain Initiative, Washington DC	06/01/2023
An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans: Year 1 experience with the BIC-BCI2000 construct Annual Meeting of the NIH Brain Initiative, Washington DC	06/01/2023
Brain-Computer Interfacing with SEEG Selectively Engages Motor Association Areas Outside of Primary Motor Cortex Neurosurgical Society of America Annual Meeting, Cape Cod, MA	06/19/2023
An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans Workshop for "innovation and challenges in closed-loop neuromodulation" Rochester, MN	08/25/2023
Experiences, innovation and challenges in closed-loop neuromodulation" BCI with SEEG: Useful?" Workshop for "innovation and challenges in closed-loop neuromodulation" Rochester, MN, August 26, 2023	08/26/2023
Increase in broadband power is an electrophysiologic marker of focal thalamic activity during movement	09/01/2023

Congress of Neurological Surgeons Annual Meeting, Washington DC	
Movement-Associated Changes in ECoG gTec ECoG MASTERCLASS 2023 (Virtual),	09/01/2023
Tandem 4-lead stimulation involving the thalamus: Strategies for leveraging a new generation of IPGs in the treatment of epilepsy Congress of Neurological Surgeons Annual Meeting, Washington DC	09/01/2023
DBS for Parkinson's Disease Pre-meeting movement workshop - Mayo Clinic Stimulation Therapies for Epilepsy 2023	09/13/2023
Evolving strategies for stimulation in epilepsy Mayo Clinic Stimulation Therapies for Epilepsy 2023, Rochester, MN,	09/15/2023
A motor association area in the depths of the central sulcus American Academy of Neurological Surgery Sea Island, Georgia	10/01/2023
Awake DBS with Microelectrode Recording Stereotactic and Functional Neurosurgery Course, Denver, CO	11/01/2023
Surgical Decision Making in Epilepsy Surgery Stereotactic and Functional Neurosurgery Course, Denver, CO	11/01/2023
An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans: Year 1 experience with the BIC-BCI2000 construct Society for Neuroscience Annual Meeting, Washington DC	11/16/2023
Homunculus Interruptus: Challenges to the Classic View of Human Motor Cortex Organization American Epilepsy Society Annual Meeting	12/01/2023
Stereo-electroencephalography as a tool to characterize the brain circuitry of movement and discover novel electrical stimulation strategies: with an illustration for treatment of myoclonus after anoxic brain injury" Queen's Square / Crick Institute, UCL, London, UK, 12/12/2023	12/12/2023
Oral	
A Finite Element Model of the Dendritic Tree To Assess Morphological Relation to Spiking Behavior. Western Medical Research Forum Carmel, California	02/02/2005 - 02/05/2005
Robust Electromyographic Control of a Robotic Arm. Northwest Biomechanics Symposium Seattle, Washington	05/14/2005 - 05/15/2005
The Seattle ECoG BCI Experiments. Third International Meeting of Brain-Computer Interface Technology Rensselaerville, New York	06/14/2005 - 06/19/2005
Toward a Multidimensional, Robust, Brain Computer Interface. School of Engineering Industry Affiliate Meeting Seattle, Washington	11/03/2005
Construction of a Robust Brain Computer Interface Using Electrographic Recording. MSTP Retreat Leavenworth, Washington	08/07/2006
Feature Correlation in an Electrographic BCI: Screening, 1-D and 2-D control. Slides delivered by Pradeep Shenoy. Third international BCI workshop Graz, Austria	09/22/2006 - 09/23/2006
Electrographic cortical changes during a working memory task. Society for Neuroscience Meeting Atlanta, Georgia	10/17/2006

Focal electrocorticographic activation associated with motor tasks in 20 human subjects. Society for Neuroscience Meeting Atlanta, Georgia	10/18/2006
The Behavioral Split in the Gamma Band. 3rd International IEEE EMBS Conference on Neural Engineering Kohala Coast, Hawaii	05/04/2007
Cortical spectral changes during actual and imagined motor movement, and the augmentation of spectral change with feedback. Society for Neuroscience Meeting San Diego, California	11/07/2007
The relation between motor movement and imagery and a quantification of the spectral augmentation during imagery-based feedback. BrainGain Symposium Utrecht, Netherlands	07/04/2008
Power law changes and their coupling to low frequency phase in electrocorticography. Max Planck Institute for Biological Cybernetics Tubingen, Germany	07/29/2008
Asynchronous changes in the cortical power spectrum, and the relation between motor movement and imagery and a quantification of the spectral augmentation during imagery-based feedback. Technical University of Graz Graz, Austria	08/01/2008
Experimental findings and a hypothesis for the role of rhythms in motor cortex. Computational Systems Neuroscience Workshops Snowbird, Utah	03/02/2009
Detection of Spontaneous Class-Specific Visual Stimuli with Temporal Accuracy in Human Electrocorticography. 31st Annual International IEEE EMBS Conference Minneapolis, Minnesota	09/02/2009 - 09/06/2009
Decoupling changes in the brain surface electrical potential to examine cortical dynamics. UCLA Brain Mapping Colloquium Los Angeles, California	11/13/2009
Spatiotemporal dynamics of category-specific processing in inferotemporal cortex. University Medical Center Utrecht, UNIEC colloquium Utrecht, Netherlands	01/12/2010
Brain surface recordings reveal that the beta rhythm dynamically modulates local cortical population activity in motor cortex during movement. The Donders Institute, Radboud University Nijmegen, Netherlands	01/20/2010
Train the Brain. Quirks and Quarks. Canadian Broadcasting Channel	03/20/2010
Real-time electrocorticographic mapping of eloquent cortex. American Association of Neurological Surgeons Annual Meeting Philadelphia, Pennsylvania	05/03/2010
Augmentation of cortical activity following use of a brain-computer interface. American Association of Neurological Surgeons Annual Meeting Philadelphia, Pennsylvania	05/04/2010
Decoding the timing and content of higher-order perceptual events from population recordings in human inferotemporal cortex. 4th International BCI Meeting	06/03/2010

Asilomar, California	
Population Computation Suppression Through Synchrony. American Society and Joint Section of Stereotactic and Functional Neurosurgery New York	06/13/2010
Brain surface electrode co-registration using MRI and x-ray. 32nd Annual International IEEE EMBS Conference Buenos Aires, Argentina	09/03/2010
The influence of rhythms on large-scale cortical computation. Bioengineering Colloquium series, University of Utah Salt Lake City, Utah	11/05/2010
The influence of rhythms on large-scale cortical computation. Computational Neuroscience Lab Colloquium, Salk Institute San Diego, California	11/09/2010
Emerging Understanding of ECoG Signal Phenomena. 2nd Intl. Workshop on Advances in Electrocorticography San Diego, California	11/12/2010
Augmentation of neuronal population activity using a brain-computer interface. g.tec's Spike & ECoG Workshop San Diego, California	11/14/2010
The dynamic influence of rhythms on early visual cortex during task engagement. Society for Neuroscience Annual Meeting San Diego, California	11/16/2010
Multiple brain rhythms play a role in actively suppressing functionally-specific cortical assemblies. Computational Systems Neuroscience Workshops Snowbird, Utah	03/01/2011
Electrocorticography for Neuroscience and BCI. Osaka-UW Joint Workshop on Cognitive Robotics and Brain-Computer Interfaces Seattle, Washington	03/18/2011
Dynamic Information Transfer Between Cortical Motor Areas During Movement. American Association of Neurological Surgeons Annual Meeting Denver, Colorado	04/13/2011
How Brain Rhythms Influence Occipital Cortex During Visual Processing. American Association of Neurological Surgeons Annual Meeting Denver, Colorado	04/13/2011
Cortical Activity During Motor Movement, Motor Imagery, and Imagery-Based Online Feedback. Stanford Neuroscience Symposium Stanford, California	05/13/2011
Distinct functional brain rhythms have specific gyral representation. American Association of Neurological Surgeons Annual Meeting Miami, Florida	04/18/2012
Human motor cortical activity is selectively phase-entrained on underlying rhythms. San Francisco Neurological Society Annual Meeting Sonoma, California	05/01/2012
Decoding single trial visual processing dynamics from temporal cortex. American Society and Joint Section of Stereotactic and Functional Neurosurgery San Francisco, California	06/01/2012
EEG Basics; LFP Basics. American Society and Joint Section of Stereotactic and Functional Neurosurgery San Francisco, California	06/01/2012
The large-scale organization and network properties of motor cortex as revealed by electrocorticography.	06/01/2012

Electrocorticography Workshop at American Society and Joint Section of Stereotactic and Functional Neurosurgery San Francisco, California	
Revisiting finger somatotopy in the human motor cortex. Stanford Neuroscience Symposium Stanford, California	06/06/2012
Tutorial on Basic ECoG Physiology. 4th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting New Orleans, Louisiana	10/17/2012
How Context Influences the Physiology of Perception. San Francisco Neurological Society Annual Meeting Sonoma, California	04/03/2013
Do brain rhythms play a role in cortical processing during language production? American Association of Neurological Surgeons Annual Meeting New Orleans, Louisiana	05/01/2013
How context influences the physiology of perception: The sub-second dynamics of repetition suppression in inferior temporal cortex. Congress of Neurological Surgeons Annual Meeting San Francisco, California	10/23/2013
Introduction to ECoG-scale Physiology. 5th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting San Diego, California	11/07/2013
Real time mapping with electrocorticography. American Association of Neurological Surgeons Annual Meeting San Francisco, California	04/09/2014
Ventral temporal cortex is a locus of visual object perception. Stanford Neuroscience Symposium Stanford, California	06/06/2014
Decoding perception from the cortical surface. Annual Meeting of the John W. Hanbery Society Stanford, California	08/02/2014
The dynamics of category-specific perception in ventral temporal cortex. National Center for Adaptive Neurotechnologies Albany, New York	08/08/2014
Broadband changes in the cortical surface potential track activation of functionally diverse neuronal populations. IEEE – EMBC Brain Mapping workshop Chicago, Illinois	08/26/2014
Instantaneous interactions between brain sites can distinguish movement from rest but are relatively poor at resolving different movement types. IEEE – EMBC Chicago, Illinois	08/26/2014
Decoding the inferior temporal cortex at the speed of perception. Congress of Neurological Surgeons, Annual Meeting Boston, Massachusetts	10/21/2014
Exploring the features that make up the brain surface electrical potential. New perspectives on Neuroengineering and Neurotechnology: Joint DFG-NSF Workshop Washington, District of Columbia	11/13/2014
Ventral temporal cortex is a locus of visual object perception. Society for Neuroscience Annual Meeting Washington, District of Columbia	11/18/2014
Percept formation in human ventral temporal cortex.	03/22/2015

San Francisco Neurological Society Annual Meeting Monterey, California	
Exploring the features that make up the brain surface electrical potential. Kaiser Redwood City Redwood City, California	04/06/2015
A novel hippocampal stereotactic coordinate system. Stanford Neuroscience Symposium Stanford, California	05/01/2015
Face percept formation in human ventral temporal cortex. American Academy of Neurological Surgeons Annual Meeting Heidelberg, Germany	10/08/2015
A hippocampal stereotactic coordinate system. European Association of Neurosurgical Societies Annual Meeting Madrid, Spain	10/20/2015
Connected Brains. Strata 2016 San Jose, California	03/16/2016
Connected Brains. https://www.oreilly.com/ideas/connected-brains Strata 2016 San Jose, California	03/31/2016
An electrical dialogue with the Brain (TEDx). https://www.youtube.com/watch?v=rAqtrBhwS80 TEDxUCSD San Diego, California	05/21/2016
Mind Reading. BBC Radio 4	08/16/2016
Fractal structure in the volumetric contrast enhancement of malignant gliomas as a marker of oxidative metabolic pathway gene expression. American Academy of Neurological Surgeons Annual Meeting Jackson Hole, Wyoming	09/15/2016
Fractal structure in volumetric contrast enhancement of malignant gliomas correlates with oxidative metabolic pathway gene expression. Congress of Neurological Surgeons Annual Meeting San Diego, California	09/27/2016
Using electrophysiology to measure and influence large-scale brain networks. 75th Annual Meeting of the Japan Neurosurgical Society. Fukuoka, Japan	09/30/2016
ECoG signatures of subcortical input to the brain surface. 10th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting San Diego, California	11/11/2016
Intraoperative Provocation Delineates Nucleus Accumbens Subregions in DBS Surgery for OCD. American Association of Neurological Surgeons Annual Meeting Los Angeles, California	04/24/2017
Decoding Face Perception from Implanted Electrodes in the Temporal Lobe. 43rd Annual Meeting of the John W. Hanbery Society Deer Valley, Utah	07/21/2017
Selective rhythmic entrainment of cortex and the suppression by synchronization hypothesis. 12th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting Washington, District of Columbia	11/10/2017
Adaptive neuromodulation in epilepsy and other disorders.	11/30/2017

13th Intl. Workshop on Electroencephalography at the American Epilepsy Society
meeting
Washington, District of Columbia

Poster

- Independent Component Analysis and Source Localization in Electroencephalography. 07/09/2004 - 07/11/2004
National MSTP Conference
Keystone, Colorado
- A Finite Element Model of Dendritic Structure. 08/20/2004 - 08/21/2004
University of Washington MSTP retreat
Leavenworth, Washington
- Real and Imagined Sources in Electroencephalography - Brain-Computer-Interface. 09/17/2004 - 09/18/2004
Workshop and Training Course at the Institute for Human Computer Interfaces
Graz, Austria
- Identifying and Using ECoG Signals for BCI Control Using Actual and Imagined Movements. 06/14/2005 - 06/19/2005
Third International Meeting of Brain-Computer Interface Technology
Rensselaerville, New York
- Thought Controlled Cursor Movement ... a Robust Brain Computer Interface. 08/19/2005
University of Washington MSTP retreat
Seattle, Washington
- Construction of an Intuitive, Complete, Hodgkin-Huxley Simulation of Action Potential Generation and Propagation. 11/12/2005 - 11/16/2005
Society for Neuroscience Meeting
Washington, District of Columbia
- Selective Attention Effects Associated with Very High Frequency Changes in Human Primary Visual Cortex. 11/12/2005 - 11/16/2005
Society for Neuroscience Meeting
Washington, District of Columbia
- Decoding two-dimensional movement trajectories from electroencephalographic signals in humans. 10/15/2006
Schalk G, Kubanek J, Miller KJ, Anderson N, Leuthardt EC, Ojemann JG, Limbrick D, Moran D, Gerhardt LA, Wolpaw JR
Society for Neuroscience Meeting
Atlanta, Georgia
- Electroencephalographic Analysis of Motor Speech. 10/17/2006
Miller KJ, Schalk G, Rouse A, Moran D, Ojemann J, Leuthardt EC
Society for Neuroscience Meeting
Atlanta, Georgia
- Separation of the Cortical Spectrum to Examine Large Scale Network Dynamics. 02/22/2007 - 02/25/2007
Miller KJ, denNijs M, Rao RPN, Ojemann JG
COSYNE
Salt Lake City, Utah
- Dynamics between Supplementary and Primary Motor Areas during Finger Movement. 04/06/2007
Miller KJ, Rao RPN, denNijs M, Ojemann JG
2007 Pacific Cascade Chapter of the Society for Neuroscience Meeting
Seattle, Washington
- Task-Related Principal Component Analysis: Method and Example 04/06/2007
Miller KJ, Ojemann JG, Rao RPN, denNijs M
2007 Pacific Cascade Chapter of the Society for Neuroscience Meeting
Seattle, Washington
- High Frequency Activity Correlates of Face and Object Recognition near Fusiform Face Area with ECoG. 04/14/2007 - 04/19/2007
Hebb AO, Miller KJ, Panagiotides H, Ojemann JG
American Association of Neurological Surgeons Annual Meeting

Washington, District of Columbia	
Real-time functional brain mapping using the chi band (76-200 Hz) in Electrocochography. Miller KJ, Makeig S, Hebb AO, Rajesh PN, Rao RPN, denNijs M, Ojemann JG American Association of Neurological Surgeons Annual Meeting Washington, District of Columbia	04/14/2007 - 04/19/2007
Uncovering the Power Law in the Cortical Spectrum. Miller KJ, Sorensen L, Ojemann JG, Rao RPN, denNijs M. University of Washington, MSTP Retreat Whidbey Island, Washington	08/01/2007
Task-Related Principal Component Analysis: Formalism and Illustration. Miller KJ, Hebb AO, Ojemann JG, Rao RPN, denNijs M. 29th IEEE EMBS Annual International Conference at Cité Internationale Lyon, France	08/23/2007 - 08/26/2007
Decoupling the cortical power spectrum. Society for Neuroscience Annual Meeting San Diego, California	11/04/2007
ECoG reveals non-linear frequency coupling during cued finger movements between motor and pre-motor areas. Darvas F, Miller KJ, Ojemann JG Society for Neuroscience Annual Meeting San Diego, California	11/04/2007
Decoupling the motor cortical power spectrum. Large Scale Brain Dynamics Symposium Whistler, British Columbia, Canada	12/07/2007
Human Cortical Power Law Amplitude Couples to delta, alpha and beta Phase. Computational Systems Neuroscience Meeting Salt Lake City, Utah	02/29/2008
Functional connectivity in language production. Cognitive Neuroscience Society Meeting San Francisco, California	03/22/2008
Electrical correlates of the resting state network in medial prefrontal cortex in humans. Cognitive Neuroscience Society Meeting San Francisco, California	03/24/2008
Robust resolution of neuronal population dynamics on a single trial basis. Computational Systems Neuroscience Meeting Salt Lake City, Utah	02/28/2009
Population computation suppression through synchrony in motor cortex. Dynamical Neuroscience XVII: Dynamical Diseases Chicago, Illinois	10/15/2009 - 10/16/2009
Reading the mind to understand variation in visual perception. American Association of Neurological Surgeons Annual Meeting Philadelphia, Pennsylvania	05/03/2010
Cortical Activity During Motor Movement, Motor Imagery, and Imagery-Based Online Feedback. 4th International BCI Meeting Asilomar, California	06/03/2010
The dynamics of electric potential motortopy in precentral cortex. Society for Neuroscience Annual Meeting San Diego, California	11/16/2010
A comparison of ECoG and fMRI to predict electrocortical stimulation. American Association of Neurological Surgeons Annual Meeting Miami, Florida	04/18/2012

Decoding single trial visual processing dynamics from temporal cortex. Stanford Neuroscience Symposium Stanford, California	06/01/2012
Distinct functional brain rhythms have specific gyral representation. Stanford Neuroscience Symposium Stanford, California	06/01/2012
Local cortical activity is phase-entrained on low-frequency rhythms in a gyral-specific manner. Society for Neuroscience Meeting New Orleans, Louisiana	10/13/2012 - 10/17/2012
Human inferior temporal cortex population-scale physiology during perception of noisy pictures of faces and places. Society for Neuroscience Meeting San Diego, California	11/09/2013 - 11/13/2013
A library of human electrocorticographic data and analyses. Society for Neuroscience Meeting San Diego, California	11/12/2016 - 11/16/2016

Regional

Oral

Electrocorticographic Cognitive Findings: Working Memory, Attention, and Face Recognition. Helen Wills Neuroscience Center, UC Berkeley Berkeley, California	12/19/2005
Electrocorticographic Cognitive Findings: Working Memory, Attention, and Face Recognition. Swartz Center for Computational Neuroscience, UC San Diego San Diego, California	12/28/2005
Electrocorticographic motor change for mapping and online feedback. Department of Radiology, UC San Francisco San Francisco, California	07/21/2006
High Frequency Electrocorticographic Changes. Helen Wills Neuroscience Center, UC Berkeley Berkeley, California	07/24/2006
High-frequency Electrocorticographic Change: A Specific Marker of Cortical Activation? Swartz Center for Computational Neuroscience, UC San Diego San Diego, California	08/04/2006
High-Frequency Electrocorticographic Features and Their Application to BCI. Neural Information Processing Systems Whistler, British Columbia, Canada	12/08/2006
Frontiers in Electrical Brain Mapping. Western Student Medical Research Forum Carmel, California	02/02/2007
Recent Advances in Electrocorticography. Harborview Regional Epilepsy Center Seattle, Washington	02/07/2007
Decoupling the cortical power spectrum in ECoG. Ramsey Lab, Rudolf Magnus Institute of Neuroscience Utrecht, Netherlands	08/30/2007
Decoupling the cortical power spectrum in ECoG. Friston Lab, University College London London, United Kingdom	09/05/2007
Decoupling the cortical power spectrum in ECoG.	09/11/2007

Graeser Lab, Bremen University Bremen, Germany	
Decoupling the cortical power spectrum in ECoG. Fries Lab, Radboud University Nijmegen, Netherlands	09/13/2007
Decoupling and using large scale electrical correlates of cortical activity. Gazzeley Lab, University of California, San Francisco San Francisco, California	11/20/2007
Changes in local cortical activity are revealed by a power law in the cortical potential spectrum. Redwood Center for Theoretical Neuroscience Berkeley, California	01/30/2008
Phase amplitude coupling and the interaction between cortical inputs. Brain Connectivity Workshop Sydney, Australia	06/13/2008
Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. University College London, United Kingdom	06/26/2008
Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. UMC Utrecht Utrecht, Netherlands	07/09/2008
Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. Technical University of Berlin Berlin, Germany	07/23/2008
Capturing Brain Surface Electrical Potentials for Application and Intuition. University of Washington Neurological Surgery Grand Rounds Seattle, Washington	06/10/2009
The role of rhythms in motor cortex. Fetz Lab, University of Washington Seattle, Washington	06/12/2009
Population computation suppression through synchrony. University of California, San Francisco San Francisco, California	07/01/2009
Category-specific subtemporal neuronal population dynamics, on a single trial basis, in humans. Adolphs Lab, California Institute of Technology Pasadena, California	07/03/2009
The role of rhythms in motor cortex. Multimodal Imaging Lab, UC San Diego San Diego, California	07/14/2009
The role of rhythms in motor cortex. Schwartz Center, UC San Diego San Diego, California	07/15/2009
The role of rhythms in motor cortex. Pesaran Lab, NYU New York City, New York	07/24/2009
Capturing Brain Surface Electrical Potentials for Application and Intuition. Albany Medical Center Albany, New York	07/29/2009
Category-specific subtemporal neuronal population dynamics, on a single trial basis,	07/30/2009

in humans.
Wadsworth Center
New York

Capturing Brain Surface Electrical Potentials for Application and Intuition. 11/11/2009
UCLA Neurological Surgery
Los Angeles, California

Electrocorticography for Electrical Brain-Mapping and Brain-Computer Interfacing. 02/04/2010
University of Washington Neurology Grand Rounds
Seattle, Washington

Robust characterization of category-specific representation in human inferotemporal cortex. 03/10/2010
University of Washington Neurological Surgery Grand Rounds
Seattle, Washington

Electrocorticographic recording in motor cortex. 04/15/2010
UC San Francisco Neurological Surgery Grand Rounds
San Francisco, California

Brain surface recordings reveal that the beta rhythm dynamically modulates local cortical population activity in motor cortex during movement. 05/06/2010
Princeton, New Jersey

Electrocorticography for Electrical Brain-Mapping and Brain-Computer Interfacing. 06/11/2010
Baylor College of Medicine Neurological Surgery Grand Rounds
Houston, Texas

Brain rhythms play a role in actively suppressing movement-specific cortical processing. 04/14/2011
Shenoy Lab
Stanford, California

The influence of brain rhythms on focal cortical activity. 06/02/2011
Neurobiology and Behavior Student Symposium
Seattle, Washington

Category-specific perception and the dynamics of inferior temporal areas. 06/04/2011
Thesis talk, University of Washington
Seattle, Washington

Faster than the blink of an eye: using electrocorticography to reveal widespread brain activity at the speed of cognition. 11/09/2012
Stanford Neurosurgery Grand Rounds
Stanford, California

Using large-scale human motor cortex physiology for mapping and brain-computer interfacing. 01/04/2013
Boston University
Boston, Massachusetts

Rhythms in the motor cortex: the role they play in motor processing and how they can improve surgical intervention for movement disorders. 08/29/2013
University Medical Center Utrecht
Utrecht, Netherlands

Decoding the mind at the speed of visual perception. 01/17/2014
Stanford Neurosurgery Grand Rounds
Stanford, California

The Dynamics of Category-Specific Perception in Inferotemporal Cortex. 03/03/2014
Thesis defense (Neurobiology and Behavior)
Seattle, Washington

The dynamics of category-specific perception in ventral temporal cortex and electrocorticographic changes in motor cortex during finger movement. 12/04/2014
Helen Wills Neuroscience Center, UC Berkeley
Berkeley, California

Stanford Epilepsy Group Colloquia: Hippocampal Stereotaxy and Human Face Perception. Stanford Neurology Stanford, California	06/05/2015
The dynamics of category-specific perception in ventral temporal cortex. Chang Lab University of California, San Francisco San Francisco, California	07/02/2015
Stereotactic, cannula-based, neurosurgical interventions for epilepsy. University Medical Center Utrecht Utrecht, Netherlands	09/07/2015
The cortical dynamics of ventral temporal face processing. University Medical Center Utrecht Utrecht, Netherlands	10/01/2015
The dynamic physiology of face perception in ventral temporal cortex. Donders Institute Nijmegen, Netherlands	11/25/2015
The suppression by synchronization hypothesis. Ruhr University Bochum Bochum, Germany	02/22/2016
Rhythmic entrainment in motor cortex and a window for new DBS devices. Medtronic Sapiens Division Eindhoven, Netherlands	03/10/2016
Spontaneous Decoding of Human Object Perception. Host: Vikash Gilja UC San Diego San Diego, California	05/19/2016
High-Grade Glioma Surgery in Utrecht, Netherlands. Stanford Neurosurgery Grand Rounds Stanford, California	07/01/2016
Fractal structure in volumetric contrast enhancement of malignant gliomas correlates with oxidative metabolic pathway gene expression. Stanford Neurosurgery Grand Rounds Stanford, California	10/17/2016
Decoding the cortex from electrocorticographic physiology. University of Louisville Grand Rounds Louisville, Kentucky	06/01/2017
Intraoperative Provocation Delineates Nucleus Accumbens Subregions in DBS Surgery for OCD. Stanford University School of Medicine Neuroscience Forum Stanford, California	06/09/2017
Understanding electrophysiology to decode and influence brain networks for the next generation of brain-computer interfaces Emory Grand Rounds Atlanta, Georgia	10/27/2017
Neurosurgery in the eloquent brain. An illustration in Glioma surgery. Santa Clara Valley Medical Center (SCVMC) Neurosurgery Symposium Santa Clara, California	03/23/2018
Poster	
Online Electrocorticographic Control of a Brain-Computer Interface. Miller KJ, Schalk G, Shenoy P, Leuthardt EC, Rao RPN, Ojemann JG UW CSE, Industrial Affiliates Meeting Seattle, Washington	10/30/2006 - 10/31/2006

Real-time Functional Mapping of Cortical Motor Areas in Humans.
Miller KJ, Shenoy P, Rao RPN, Ojemann JG
UW CSE, Industrial Affiliates Meeting
Seattle, Washington

10/30/2006 - 10/31/2006

Visiting Professorship

Visiting Professorships

Visiting Professor
(R6 year)
University of Louisville
Louisville, Kentucky

05/31/2017 - 06/02/2017

Visiting Professor
Mayo Clinic Florida, July 29-30, 2019

07/29/2019 - 07/30/2019

Quality Initiatives

Quality Improvement Projects

Reducing Surgical Site Infections for Deep Brain Stimulation Implantable Generator Surgery: a Quality Improvement Initiative (Silver Project) Juliana C. Capp, MD (Team Lead), Panos Kerezoudis, MD, MS, **Kai J. Miller, MD, PhD.** 03/14/2024

Research Grants Awarded

Active Grants

Federal

Other Significant Contributor CRCNS: Processing speed in the human connectome across the lifespan. Funded by National Institute of Mental Health. (R01 MH 122258) 09/2019 - 06/2025

Other Significant Contributor Investigation of Stereotyped High-Frequency Oscillations with Computational Intelligence for the Prediction of Seizure Onset Zone in Epilepsy. Funded by National Institute of Neurological Disorders and Stroke. (R01 NS112497) 11/2023 - 04/2025

Other Significant Contributor Acute Modulation of Stereotyped High Frequency Oscillations with a Closed-Loop Brain Interchange System in Drug Resistant Epilepsy. Funded by National Institute of Neurological Disorders and Stroke. (UH3 NS117944) 03/2024 - 02/2027

Program Director / Principal Investigator An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans. Funded by National Institute of Neurological Disorders and Stroke. (U01 NS128612) 09/2022 - 08/2026

Co-Investigator Development and validation of empirical models of the neuronal population activity underlying non-invasive human brain measurements. Funded by NIH. (NIH RO1 1R01MH111417-01) 09/2016 - 06/2021

Co-Investigator Novel diagnostic stimulation to quantify cortical excitability and guide epilepsy therapy. Funded by National Institute of Neurological Disorders and Stroke. (R01 NS129622) 08/2023 - 07/2028

Co-Investigator Electrical stimulation to control feedback modulation of perception. Funded by National Eye Institute. (R01 EY 35533) 09/2023 - 06/2027

Federal sub award

Program Director / Principal Investigator The Minnesota Stylet Array: An intraoperative stylet-based electrode array for mapping subcortical brain regions. Funded by Minnesota Partnership for Biotechnology and Medical Genomics. (MNP #21.42) 01/2022 - 01/2025

Co-Investigator Seen and mental images in visual cortex. Funded by National Eye Institute. (EY 23384) 09/2022 - 05/2026

Co-Investigator UMN-Mayo Partnership Application (Department of Psychiatry). 05/2023 - 04/2025

Funded by Minnesota Partnership for Biotechnology and Medical Genomics. (P010969401)

Industry

Program Director / Principal Investigator	Cortical Paddle Leads for Parkinson's Disease. Funded by Boston Scientific Corporation	10/2021 - 09/2022
Co-Investigator	Amendment 1: RNS System Responsive Stimulation for Adolescents with Epilepsy Study. Funded by NeuroPace, Inc. (NP10014)	11/2021 - 10/2024

Mayo Clinic

Program Director / Principal Investigator	Exploration of Human Brain Motor Networks using Implanted Electrodes . Funded by Development - Benefactor Funded Career Development Award	07/2022 - 06/2025
Program Director / Principal Investigator	GTEC equipment Renewal . Funded by SGP - Small Grants Program <\$10K	07/2024 - 07/2026

Completed Grants

Federal

Consultant	Memory, Attention, and Default Mode Processes in Human Posteromedial Cortex. Funded by NIH. (R01 NS078396-01)	03/2012 - 02/2017
KL2 Scholar	Institutional Career Development Core (CCaTS KL2 Mentored Career Development Program). Funded by National Center for Advancing Translational Sciences. (KL2 TR 02379)	09/2017 - 07/2022

Federal sub award

Program Director / Principal Investigator	Optimizing Deep Brain Stimulation for Obsessive-Compulsive Disorder. Funded by New Venture Fund	08/2020 - 07/2023
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Foundation

Program Director / Principal Investigator	An Implanted Brain-Computer Interface for ALS Patients. Funded by Brain Research Foundation. (BRFSG-2019-03)	06/2019 - 05/2021
Program Director / Principal Investigator	The electrophysiology of obsessive-compulsive disorder in ventral striatum during awake neurosurgery. Funded by Brain and Behavior Research Foundation	01/2020 - 01/2024
Investigator	Exploring the Neural Dynamics of Cognition through Human Electrooculography. Funded by National Science Foundation. (NSF 0642848)	04/2007 - 03/2010

Mayo Clinic

Program Director / Principal Investigator	Puget Systems Computer. Funded by SGP - Small Grants Program <\$10K	11/2019 - 11/2021
Co-Program Director / Principal Investigator	Characterization of cerebral hemodynamic changes induced by chronic alcohol consumption and neuromodulation using functional ultrasound in a mouse model of alcohol use disorder. . Funded by Ultrasound Research Pilot	01/2022 - 12/2022

Bibliography

Peer-reviewed Articles

1. Leuthardt EC, **Miller KJ**, Schalk G, Rao RP, Ojemann JG. Electrocorticography-based brain computer interface--the Seattle experience. *IEEE Trans Neural Syst Rehabil Eng.* 2006 Jun; 14 (2):194-8 PMID: 16792292 DOI: 10.1109/TNSRE.2006.875536
2. Ojemann JG, Leuthardt EC, **Miller KJ**. Brain-machine interface: restoring neurological function through bioengineering. *Clin Neurosurg.* 2007; 54:134-6 PMID: 18504910
3. **Miller KJ**, Hebb AO, Ojemann JG, Rao RP, Dennijs M. Task-related principal component analysis: formalism and illustration. *Conf Proc IEEE Eng Med Biol Soc.* 2007; 2007:5469-72 PMID: 18003249 DOI: 10.1109/IEMBS.2007.4353583
4. **Miller KJ**, Leuthardt EC, Schalk G, Rao RP, Anderson NR, Moran DW, Miller JW, Ojemann JG. Spectral changes in cortical surface potentials during motor movement. *J Neurosci.* 2007 Feb 28; 27 (9):2424-32 PMID: 17329441 PMID: 6673496 DOI: 10.1523/JNEUROSCI.3886-06.2007
5. Leuthardt EC, **Miller K**, Anderson NR, Schalk G, Dowling J, Miller J, Moran DW, Ojemann JG. Electrocorticographic frequency alteration mapping: a clinical technique for mapping the motor cortex. *Neurosurgery.* 2007 Apr; 60 (4 Suppl 2):260-70; discussion 270-1 PMID: 17415162 DOI: 10.1227/01.NEU.0000255413.70807.6E
6. **Miller KJ**, Makeig S, Hebb AO, Rao RP, denNijs M, Ojemann JG. Cortical electrode localization from X-rays and simple mapping for electrocorticographic research: The "Location on Cortex" (LOC) package for MATLAB. *J Neurosci Methods.* 2007 May 15; 162 (1-2):303-8 Epub 2007 Feb 01 PMID: 17343918 DOI: 10.1016/j.jneumeth.2007.01.019
7. **Miller KJ**, denNijs M, Shenoy P, Miller JW, Rao RP, Ojemann JG. Real-time functional brain mapping using electrocorticography. *Neuroimage.* 2007 Aug 15; 37 (2):504-7 Epub 2007 May 25 PMID: 17604183 DOI: 10.1016/j.neuroimage.2007.05.029
8. Schalk G, Kubanek J, **Miller KJ**, Anderson NR, Leuthardt EC, Ojemann JG, Limbrick D, Moran D, Gerhardt LA, Wolpaw JR. Decoding two-dimensional movement trajectories using electrocorticographic signals in humans. *J Neural Eng.* 2007 Sep; 4 (3):264-75 Epub 2007 June 22 PMID: 17873429 DOI: 10.1088/1741-2560/4/3/012
9. Zanos S, **Miller KJ**, Ojemann JG. Electrocorticographic spectral changes associated with ipsilateral individual finger and whole hand movement. *Conf Proc IEEE Eng Med Biol Soc.* 2008; 2008:5939-42 PMID: 19164072 DOI: 10.1109/IEMBS.2008.4650569
10. Shenoy P, **Miller KJ**, Ojemann JG, Rao RP. Generalized features for electrocorticographic BCIs. *IEEE Trans Biomed Eng.* 2008 Jan; 55 (1):273-80 PMID: 18232371 DOI: 10.1109/TBME.2007.903528
11. Blakely T, **Miller KJ**, Rao RP, Holmes MD, Ojemann JG. Localization and classification of phonemes using high spatial resolution electrocorticography (ECoG) grids. *Conf Proc IEEE Eng Med Biol Soc.* 2008; 2008:4964-7 PMID: 19163831 DOI: 10.1109/IEMBS.2008.4650328
12. Holmes MD, Brown M, Tucker DM, Saneto RP, **Miller KJ**, Wig GS, Ojemann JG. Localization of extratemporal seizure with noninvasive dense-array EEG. Comparison with intracranial recordings. *Pediatr Neurosurg.* 2008; 44 (6):474-9 Epub 2008 Dec 10 PMID: 19066438 DOI: 10.1159/000180302
13. **Miller KJ**, Blakely T, Schalk G, den Nijs M, Rao RP, Ojemann JG. Three cases of feature correlation in an electrocorticographic BCI. *Conf Proc IEEE Eng Med Biol Soc.* 2008; 2008:5318-21 PMID: 19163918 DOI: 10.1109/IEMBS.2008.4650415
14. Shenoy P, **Miller KJ**, Crawford B, Rao RN. Online electromyographic control of a robotic prosthesis. *IEEE Trans Biomed Eng.* 2008 Mar; 55 (3):1128-35 PMID: 18334405 DOI: 10.1109/TBME.2007.909536
15. Schalk G, **Miller KJ**, Anderson NR, Wilson JA, Smyth MD, Ojemann JG, Moran DW, Wolpaw JR, Leuthardt EC. Two-dimensional movement control using electrocorticographic signals in humans. *J Neural Eng.* 2008 Mar; 5 (1):75-84 Epub 2008 Feb 01 PMID: 18310813 PMID: 2744037 DOI: 10.1088/1741-2560/5/1/008
16. **Miller KJ**, Shenoy P, den Nijs M, Sorensen LB, Rao RN, Ojemann JG. Beyond the gamma band: the role of high-frequency features in movement classification. *IEEE Trans Biomed Eng.* 2008 May; 55 (5):1634-7 PMID: 18440909 DOI: 10.1109/TBME.2008.918569
17. Penny WD, Duzel E, **Miller KJ**, Ojemann JG. Testing for nested oscillation. *J Neurosci Methods.* 2008 Sep 15; 174 (1):50-61 Epub 2008 July 15 PMID: 18674562 PMID: 2675174 DOI: 10.1016/j.jneumeth.2008.06.035
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