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 Reasearchers 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
Reseach Assistant - NASA, Johnson Space Center, Houston, Texas Environmental Physiology Lab. Advisors: Michael Gernhardt and Michael Powell (1999).	1999
Reseach 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
Reseach 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 2010 - Present
Guest Editor 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 05/23/2018 - Present
(Annual BCI Award (2018), Presented at 7th International BCI meeting, Asilomar, CA,)

International Workshop
Moderator 08/24/2023 - 08/25/2023
("An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans: innovation and challenges in closed-loop neuromodulation",)

Society for Neuroscience
Scientific Reviewer 11/11/2016 - Present
(Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting, San Diego, CA,)

Education Interests and Accomplishments

Teaching

Physics 1B: 2nd Quarter Introductory Physics. 01/2000 - 03/2000
Teaching Assistant
University of California
San Diego, California

Physics 428A: The Physics of Biological Vision. 06/2001 - 08/2001
Teaching Assistant
University of Washington
Seattle, Washington

Minority Medical Education Program: Introductory Physics 06/2002 - 08/2002
Course Instructor
University of Washington
Seattle, Washington

Minority Medical Education Program: Introductory Physics 06/2003 - 08/2003
Course Instructor
University of Washington
Seattle, Washington

CSE 590RR: Introduction to Computational Neuroscience. 09/2003 - 12/2003
Teaching Assistant
University of Washington
Seattle, Washington

CSE 590RR: Introduction to Computational Neuroscience. Poisson Statistics and Stochasticity in Neuronal Spike Timing. 10/2003
Guest Lecturer
University of Washington
Seattle, Washington

Minority Medical Education Program: Introductory Physics 06/2004 - 08/2004
Course Instructor
University of Washington
Seattle, Washington

Realtime Classification of Electromyogram for Robotic Arm Control. 12/2004
Demonstration by Crawford B, Miller KJ, Shenoy P, Rao R
Neural Information Processing Systems
Vancouver, British Columbia, Canada

CSE/NEUBEH 528: Computational Neuroscience. Compartmental Models for Potential Propagation. 01/2005 - 02/2005
Guest Lecturer
University of Washington
Seattle, Washington

CSE/NEUBEH 528: Computational Neuroscience. 01/2005 - 03/2005
Teaching Assistant
University of Washington
Seattle, Washington

Cogs160: Brain Computer Interfaces. Electrocorticographic Brain Computer Interfaces. 06/2005 - 08/2005
Guest Lecturer
University of California
San Diego, California

CSE 599E: Brain Computer Interfaces. Using Electrocorticographic Motor Signals for Device Control. 03/2006 - 05/2006
Guest Lecturer
University of Washington
Seattle, Washington

CSE490I: Neurobotics. Translating Brain Signals. 01/2007 - 03/2007
Guest Lecturer
University of Washington
Seattle, Washington

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 Electrocorticography
Current Status:
Outcome:

Blakeley, Tim (Graduate Student) 01/2007 - 12/2010
Description: Graduate Student (Bioengineering). Research Topic: Electrocorticography 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, Panogiotis 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, Portugal

5th Annual World Course in Advanced Techniques in Neurosurgical Oncology 06/22/2016 - 06/26/2016
London, England, United Kingdom

AANS/ASSFN/NREF Stereotactic and Functional Neurosurgery Hands-on Workshop 11/04/2016 - 11/06/2016
Aurora, Colorado

Scientific Chair: 10th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting. 11/11/2016 - Present
San Diego, California

How to safely operate: In, through, and around the Cavernous Sinus. 10/13/2017 - 10/16/2017
Arkansas Neurosciences Institute
Little Rock, Arkansas

Presentations Extramural

National or International

Invited

The peaks and the power laws in the cortical spectrum. 12/07/2007
Large Scale Brain Dynamics Symposium
Whistler, British Columbia, Canada

Large Scale Brain Dynamics. 12/07/2007 - 12/08/2007
Organizer, Moderators: Kai J. Miller, Ryan Canolty
Symposium in Whistler
Whistler, British Columbia, Canada

The consequences of brain rhythms in the organization of neuronal computation. 03/02/2009
Organizer, Moderators: Kai J. Miller, Thilo Womelsdorf
Workshop in Snowbird
Snowbird, Utah

Developing simplified algebras to describe large-scale brain dynamics. 02/28/2011 - 03/01/2011
Organizer, Moderators: Kai J. Miller, Thilo Womelsdorf
Workshop in Snowbird
Snowbird, Utah

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 Korea

Decoding face perception from the ventral temporal lobe. 01/09/2017
Invited Keynote.

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 AblationMayo 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 09/01/2023
gTec ECoG MASTERCLASS 2023 (Virtual),

Tandem 4-lead stimulation involving the thalamus: Strategies for leveraging a new generation of IPGsin the treatment of epilepsy 09/01/2023
Congress of Neurological Surgeons Annual Meeting, Washington DC

DBS for Parkinson's Disease 09/13/2023
Pre-meeting movement workshop - Mayo Clinic Stimulation Therapies for Epilepsy 2023

Evolving strategies for stimulation in epilepsy 09/15/2023
Mayo Clinic Stimulation Therapies for Epilepsy 2023, Rochester, MN,

A motor association area in the depths of the central sulcus 10/01/2023
American Academy of Neurological Surgery Sea Island, Georgia

Awake DBS with Microelectrode Recording 11/01/2023
Stereotactic and Functional Neurosurgery Course, Denver, CO

Surgical Decision Making in Epilepsy Surgery 11/01/2023
Stereotactic and Functional Neurosurgery Course, Denver, CO

An Ecosystem of Technology and Protocols for Adaptive Neuromodulation Research in Humans: Year 1 experience with the BIC-BCI2000 construct 11/16/2023
Society for Neuroscience Annual Meeting, Washington DC

Homunculus Interruptus: Challenges to the Classic View of Human Motor Cortex Organization 12/01/2023
American Epilepsy Society Annual Meeting

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" 12/12/2023
Queen's Square / Crick Institute, UCL, London, UK, 12/12/2023

Oral

A Finite Element Model of the Dendritic Tree To Assess Morphological Relation to Spiking Behavior. 02/02/2005 - 02/05/2005
Western Medical Research Forum
Carmel, California

Robust Electromyographic Control of a Robotic Arm. 05/14/2005 - 05/15/2005
Northwest Biomechanics Symposium
Seattle, Washington

The Seattle ECoG BCI Experiments. 06/14/2005 - 06/19/2005
Third International Meeting of Brain-Computer Interface Technology
Rensselaerville, New York

Toward a Multidimensional, Robust, Brain Computer Interface. 11/03/2005
School of Engineering Industry Affiliate Meeting
Seattle, Washington

Construction of a Robust Brain Computer Interface Using Electrocorticographic Recording. 08/07/2006
MSTP Retreat
Leavenworth, Washington

Feature Correlation in an Electrocorticographic BCI: Screening, 1-D and 2-D control. 09/22/2006 - 09/23/2006
Slides delivered by Pradeep Shenoy.
Third international BCI workshop
Graz, Austria

Electrocorticographic cortical changes during a working memory task. 10/17/2006
Society for Neuroscience Meeting
Atlanta, Georgia

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. 06/13/2010
American Society and Joint Section of Stereotactic and Functional Neurosurgery
New York

Brain surface electrode co-registration using MRI and x-ray. 09/03/2010
32nd Annual International IEEE EMBS Conference
Buenos Aires, Argentina

The influence of rhythms on large-scale cortical computation. 11/05/2010
Bioengineering Colloquium series, University of Utah
Salt Lake City, Utah

The influence of rhythms on large-scale cortical computation. 11/09/2010
Computational Neuroscience Lab Colloquium, Salk Institute
San Diego, California

Emerging Understanding of ECoG Signal Phenomena. 11/12/2010
2nd Intl. Workshop on Advances in Electrocorticography
San Diego, California

Augmentation of neuronal population activity using a brain-computer interface. 11/14/2010
g.tec's Spike & ECoG Workshop
San Diego, California

The dynamic influence of rhythms on early visual cortex during task engagement. 11/16/2010
Society for Neuroscience Annual Meeting
San Diego, California

Multiple brain rhythms play a role in actively suppressing functionally-specific cortical assemblies. 03/01/2011
Computational Systems Neuroscience Workshops
Snowbird, Utah

Electrocorticography for Neuroscience and BCI. 03/18/2011
Osaka-UW Joint Workshop on Cognitive Robotics and Brain-Computer Interfaces
Seattle, Washington

Dynamic Information Transfer Between Cortical Motor Areas During Movement. 04/13/2011
American Association of Neurological Surgeons Annual Meeting
Denver, Colorado

How Brain Rhythms Influence Occipital Cortex During Visual Processing. 04/13/2011
American Association of Neurological Surgeons Annual Meeting
Denver, Colorado

Cortical Activity During Motor Movement, Motor Imagery, and Imagery-Based Online Feedback. 05/13/2011
Stanford Neuroscience Symposium
Stanford, California

Distinct functional brain rhythms have specific gyral representation. 04/18/2012
American Association of Neurological Surgeons Annual Meeting
Miami, Florida

Human motor cortical activity is selectively phase-entrained on underlying rhythms. 05/01/2012
San Francisco Neurological Society Annual Meeting
Sonoma, California

Decoding single trial visual processing dynamics from temporal cortex. 06/01/2012
American Society and Joint Section of Stereotactic and Functional Neurosurgery
San Francisco, California

EEG Basics; LFP Basics. 06/01/2012
American Society and Joint Section of Stereotactic and Functional Neurosurgery
San Francisco, California

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 electrocorticograpy. 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. 04/06/2015
Kaiser Redwood City
Redwood City, California

A novel hippocampal stereotactic coordinate system. 05/01/2015
Stanford Neuroscience Symposium
Stanford, California

Face percept formation in human ventral temporal cortex. 10/08/2015
American Academy of Neurological Surgeons Annual Meeting
Heidelberg, Germany

A hippocampal stereotactic coordinate system. 10/20/2015
European Association of Neurosurgical Societies Annual Meeting
Madrid, Spain

Connected Brains. 03/16/2016
Strata 2016
San Jose, California

Connected Brains. 03/31/2016
https://www.oreilly.com/ideas/connected-brains
Strata 2016
San Jose, California

An electrical dialogue with the Brain (TEDx). 05/21/2016
https://www.youtube.com/watch?v=rAqtrBhwS80
TEDxUCSD
San Diego, California

Mind Reading. 08/16/2016
BBC Radio 4

Fractal structure in the volumetric contrast enhancement of malignant gliomas as a marker of oxidative metabolic pathway gene expression. 09/15/2016
American Academy of Neurological Surgeons Annual Meeting
Jackson Hole, Wyoming

Fractal structure in volumetric contrast enhancement of malignant gliomas correlates with oxidative metabolic pathway gene expression. 09/27/2016
Congress of Neurological Surgeons Annual Meeting
San Diego, California

Using electrophysiology to measure and influence large-scale brain networks. 09/30/2016
75th Annual Meeting of the Japan Neurosurgical Society.
Fukuoka, Japan

ECoG signatures of subcortical input to the brain surface. 11/11/2016
10th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting
San Diego, California

Intraoperative Provocation Delineates Nucleus Accumbens Subregions in DBS Surgery for OCD. 04/24/2017
American Association of Neurological Surgeons Annual Meeting
Los Angeles, California

Decoding Face Perception from Implanted Electrodes in the Temporal Lobe. 07/21/2017
43rd Annual Meeting of the John W. Hanbery Society
Deer Valley, Utah

Selective rhythmic entrainment of cortex and the suppression by synchronization hypothesis. 11/10/2017
12th Intl. Workshop on Electrocorticography at Society for Neuroscience Meeting
Washington, District of Columbia

Adaptive neuromodulation in epilepsy and other disorders. 11/30/2017

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

Poster

Independent Component Analysis and Source Localization in Electrocorticography. 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 Electrocorticography - 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 electrocorticographic 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

Electrocorticographic 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 Electrocorticography. 04/14/2007 - 04/19/2007
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

Uncovering the Power Law in the Cortical Spectrum. 08/01/2007
Miller KJ, Sorensen L, Ojemann JG, Rao RPN, denNijs M.
University of Washington, MSTP Retreat
Whidbey Island, Washington

Task-Related Principal Component Analysis: Formalism and Illustration. 08/23/2007 - 08/26/2007
Miller KJ, Hebb AO, Ojemann JG, Rao RPN, denNijs M.
29th IEEE EMBS Annual International Conference at Cité Internationale
Lyon, France

Decoupling the cortical power spectrum. 11/04/2007
Society for Neuroscience Annual Meeting
San Diego, California

ECoG reveals non-linear frequency coupling during cued finger movements between motor and pre-motor areas. 11/04/2007
Darvas F, Miller KJ, Ojemann JG
Society for Neuroscience Annual Meeting
San Diego, California

Decoupling the motor cortical power spectrum. 12/07/2007
Large Scale Brain Dynamics Symposium
Whistler, British Columbia, Canada

Human Cortical Power Law Amplitude Couples to delta, alpha and beta Phase. 02/29/2008
Computational Systems Neuroscience Meeting
Salt Lake City, Utah

Functional connectivity in language production. 03/22/2008
Cognitive Neuroscience Society Meeting
San Francisco, California

Electrical correlates of the resting state network in medial prefrontal cortex in humans. 03/24/2008
Cognitive Neuroscience Society Meeting
San Francisco, California

Robust resolution of neuronal population dynamics on a single trial basis. 02/28/2009
Computational Systems Neuroscience Meeting
Salt Lake City, Utah

Population computation suppression through synchrony in motor cortex. 10/15/2009 - 10/16/2009
Dynamical Neuroscience XVII: Dynamical Diseases
Chicago, Illinois

Reading the mind to understand variation in visual perception. 05/03/2010
American Association of Neurological Surgeons Annual Meeting
Philadelphia, Pennsylvania

Cortical Activity During Motor Movement, Motor Imagery, and Imagery-Based Online Feedback. 06/03/2010
4th International BCI Meeting
Asilomar, California

The dynamics of electric potential motortopy in precentral cortex. 11/16/2010
Society for Neuroscience Annual Meeting
San Diego, California

A comparison of ECoG and fMRI to predict electrocortical stimulation. 04/18/2012
American Association of Neurological Surgeons Annual Meeting
Miami, Florida

Decoding single trial visual processing dynamics from temporal cortex. 06/01/2012
Stanford Neuroscience Symposium
Stanford, California

Distinct functional brain rhythms have specific gyral representation. 06/01/2012
Stanford Neuroscience Symposium
Stanford, California

Local cortical activity is phase-entrained on low-frequency rhythms in a gyrally-specific manner. 10/13/2012 - 10/17/2012
Society for Neuroscience Meeting
New Orleans, Louisiana

Human inferior temporal cortex population-scale physiology during perception of noisy pictures of faces and places. 11/09/2013 - 11/13/2013
Society for Neuroscience Meeting
San Diego, California

A library of human electrocorticographic data and analyses. 11/12/2016 - 11/16/2016
Society for Neuroscience Meeting
San Diego, California

Regional

Oral

Electrocorticographic Cognitive Findings: Working Memory, Attention, and Face Recognition. 12/19/2005
Helen Wills Neuroscience Center, UC Berkeley
Berkeley, California

Electrocorticographic Cognitive Findings: Working Memory, Attention, and Face Recognition. 12/28/2005
Swartz Center for Computational Neuroscience, UC San Diego
San Diego, California

Electrocorticographic motor change for mapping and online feedback. 07/21/2006
Department of Radiology, UC San Francisco
San Francisco, California

High Frequency Electrocorticographic Changes. 07/24/2006
Helen Wills Neuroscience Center, UC Berkeley
Berkeley, California

High-frequency Electrocorticographic Change: A Specific Marker of Cortical Activation? 08/04/2006
Swartz Center for Computational Neuroscience, UC San Diego
San Diego, California

High-Frequency Electrocorticographic Features and Their Application to BCI. 12/08/2006
Neural Information Processing Systems
Whistler, British Columbia, Canada

Frontiers in Electrical Brain Mapping. 02/02/2007
Western Student Medical Research Forum
Carmel, California

Recent Advances in Electrocorticography. 02/07/2007
Harborview Regional Epilepsy Center
Seattle, Washington

Decoupling the cortical power spectrum in ECoG. 08/30/2007
Ramsey Lab, Rudolf Magnus Institute of Neuroscience
Utrecht, Netherlands

Decoupling the cortical power spectrum in ECoG. 09/05/2007
Friston Lab, University College London
London, United Kingdom

Decoupling the cortical power spectrum in ECoG. 09/11/2007

Graeser Lab, Bremen University
Bremen, Germany

Decoupling the cortical power spectrum in ECoG. 09/13/2007
Fries Lab, Radboud University
Nijmegen, Netherlands

Decoupling and using large scale electrical correlates of cortical activity. 11/20/2007
Gazzeley Lab, University of California, San Francisco
San Francisco, California

Changes in local cortical activity are revealed by a power law in the cortical potential spectrum. 01/30/2008
Redwood Center for Theoretical Neuroscience
Berkeley, California

Phase amplitude coupling and the interaction between cortical inputs. 06/13/2008
Brain Connectivity Workshop
Sydney, Australia

Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. 06/26/2008
University College
London, United Kingdom

Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. 07/09/2008
UMC Utrecht
Utrecht, Netherlands

Phase-amplitude coupling in the electrocorticographic measurement from motor cortex. 07/23/2008
Technical University of Berlin
Berlin, Germany

Capturing Brain Surface Electrical Potentials for Application and Intuition. 06/10/2009
University of Washington Neurological Surgery Grand Rounds
Seattle, Washington

The role of rhythms in motor cortex. 06/12/2009
Fetz Lab, University of Washington
Seattle, Washington

Population computation suppression through synchrony. 07/01/2009
University of California, San Francisco
San Francisco, California

Category-specific subtemporal neuronal population dynamics, on a single trial basis, in humans. 07/03/2009
Adolphs Lab, California Institute of Technology
Pasadena, California

The role of rhythms in motor cortex. 07/14/2009
Multimodal Imaging Lab, UC San Diego
San Diego, California

The role of rhythms in motor cortex. 07/15/2009
Schwartz Center, UC San Diego
San Diego, California

The role of rhythms in motor cortex. 07/24/2009
Pesaran Lab, NYU
New York City, New York

Capturing Brain Surface Electrical Potentials for Application and Intuition. 07/29/2009
Albany Medical Center
Albany, New York

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. 06/05/2015
Stanford Neurology
Stanford, California

The dynamics of category-specific perception in ventral temporal cortex. 07/02/2015
Chang Lab
University of California, San Francisco
San Francisco, California

Stereotactic, cannula-based, neurosurgical interventions for epilepsy. 09/07/2015
University Medical Center Utrecht
Utrecht, Netherlands

The cortical dynamics of ventral temporal face processing. 10/01/2015
University Medical Center Utrecht
Utrecht, Netherlands

The dynamic physiology of face perception in ventral temporal cortex. 11/25/2015
Donders Institute
Nijmegen, Netherlands

The suppression by synchronization hypothesis. 02/22/2016
Ruhr University Bochum
Bochum, Germany

Rhythmic entrainment in motor cortex and a window for new DBS devices. 03/10/2016
Medtronic Sapiens Division
Eindhoven, Netherlands

Spontaneous Decoding of Human Object Perception. 05/19/2016
Host: Vikash Gilja
UC San Diego
San Diego, California

High-Grade Glioma Surgery in Utrecht, Netherlands. 07/01/2016
Stanford Neurosurgery Grand Rounds
Stanford, California

Fractal structure in volumetric contrast enhancement of malignant gliomas correlates with oxidative metabolic pathway gene expression. 10/17/2016
Stanford Neurosurgery Grand Rounds
Stanford, California

Decoding the cortex from electrocorticographic physiology. 06/01/2017
University of Louisville Grand Rounds
Louisville, Kentucky

Intraoperative Provocation Delineates Nucleus Accumbens Subregions in DBS Surgery for OCD. 06/09/2017
Stanford University School of Medicine Neuroscience Forum
Stanford, California

Understanding electrophysiology to decode and influence brain networks for the next generation of brain-computer interfaces 10/27/2017
Emory Grand Rounds
Atlanta, Georgia

Neurosurgery in the eloquent brain. An illustration in Glioma surgery. 03/23/2018
Santa Clara Valley Medical Center (SCVMC) Neurosurgery Symposium
Santa Clara, California

Poster

Online Electrocorticographic Control of a Brain-Computer Interface. 10/30/2006 - 10/31/2006
Miller KJ, Schalk G, Shenoy P, Leuthardt EC, Rao RPN, Ojemann JG
UW CSE, Industrial Affiliates Meeting
Seattle, Washington

Real-time Functional Mapping of Cortical Motor Areas in Humans. 10/30/2006 - 10/31/2006
Miller KJ, Shenoy P, Rao RPN, Ojemann JG
UW CSE, Industrial Affiliates Meeting
Seattle, Washington

Visiting Professorship

Visiting Professorships

Visiting Professor 05/31/2017 - 06/02/2017
(R6 year)
University of Louisville
Louisville, Kentucky

Visiting Professor 07/29/2019 - 07/30/2019
Mayo Clinic Florida, July 29-30, 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

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 Electrocorticography. 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 PMCID: 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
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* Indicates the primary author was a mentee of this author.
# Indicates the authors contributed equally.