Karim G. Oweiss

Biographical Information

Personal Information

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Expertise Keywords

Neuroplasticity, Sensorimotor integration, Biological and artificial intelligence, Deep Brain Stimulation (DBS) and Recording in humans with movement and cognitive disorders.

EDUCATION

2002 **Postdoctoral Research Fellow**, Biomedical Engineering Dept., Univ. of Michigan, Ann Arbor

1998-2002 **PhD,** Electrical Engineering and Computer Science, Univ. of Michigan, Ann Arbor

1994-1996 **MS,** Electrical & Computer Engineering, Univ. of Alexandria, Egypt

1988-1993 **BS,** Electrical & Computer Engineering (minor: Bioengineering), Univ. of Alexandria, Egypt

POSITIONS

2023 – **Professor**, Astraeus Space Research Institute, University of Florida

2021 **Visiting Professor (Sabbatical)**, Institute of Vision, Sorbonne University/INSERM, Paris, France

2016 – **Professor**, Department of Neurology, Norman Fixel Institute for Neurological Disorders, University of Florida

2014 – **Professor**, Department of Biomedical Engineering, University of Florida

2014 – **Professor**, Department of Neuroscience, McKnight Brain Institute, University of Florida

2014 – **Pre-eminent Professor** (Tenured), Electrical & Computer Engineering, University of Florida

2014 **Visiting Professor (Sabbatical)**, Dept. of Neurosurgery, Spectrum Health, Grand Rapids, Michigan

2012 – 2014 **Associate Professor**, Cognitive Science Program, Michigan State University

2009 – 2014 **Associate Professor,** Neuroscience Program, Michigan State University

2009 – 2014 **Associate Professor** (tenured), Electrical & Computer Engineering Dept., Michigan State University

2005 – 2009 **Assistant Professor**, Neuroscience Program, Michigan State University

2003 – 2009 **Assistant Professor** (tenure track), Electrical & Computer Engineering, Michigan State University

HONORS & AWARDS

2023 Fellow University of Florida's 2024 Advanced Leadership for Academics and Professionals

2018 – 2021 UF Foundation Professor

2014 – Pre-Eminence Professor, College of Engineering, University of Florida

2011 – Senior Member, Institute for Electrical and Electronics Engineering (IEEE)

2006 – 2008 Member, IEEE Signal Processing Society Board of Directors

2003 Lilly Teaching Fellow

2001 Best Student Paper, 23rd IEEE Int. Conference on Eng. in Medicine & Biology*

*For the paper: "Neural Source Localization using Advanced Sensor Array Signal Processing Techniques," *in Proc. of IEEE Engineering in Medicine & Biology*, (I): 707-710, 2001

2001 Excellence in Neural Engineering Award from National Science Foundation

1998 Graduate Fellowship, University of Michigan

1993 Outstanding Undergraduate Student Award, University of Alexandria, Egypt

Leadership Experience

- ***Mentorship:*** 4 Research Assistant Professors, 10 Postdoctoral fellows (3 are now fully tenured faculty), 15 PhD students (2 are tenure-track professors), 16 MS students and over 56 undergraduate students and medical residency fellows pursuing research across multiple disciplines that include electrical and computer engineering, biomedical engineering, computer science, neuroscience, and neurology.
- ***Lead Principal Investigator*** "*AI Institute: Advancing Neurobiology of Learning across the Lifespan*" totaling **$20M** in response to NSF's call for Artificial Intelligence Institutes during the 2021 cycle; led a highly multidisciplinary team consisted of 38 faculty across 6 universities and 6 non-profit organizations.
- ***Principal Investigator*****:** "Institute for Engineering and Health" proposal to Michigan State University's President's initiative and outreach to major donors.
- ***Co-Investigator*****:** Multiple training grants at pre (NIH F31, Kirschstein National Research Service Award (NRSA)) and postdoctoral levels (NIH T32) within biomedical engineering, neuroscience and neuro-restoration.
- ***Assistant Chair for graduate admission and recruiting (2022-2024):*** matriculated PhD applications increased by 15% (reversal of a 3-year decline), MS applications increased by 23% (an all-time high, reversal of a 3-year decline), matriculated MS applications increased by 9% (reversal of a 2-year decline), Dean's Research Fellowship matriculation rate increased by 24% (following introduction of a new rotation program to help retention), and retention increased by 10%, graduate applications from Underrepresented Minority (URM) groups increased by 34%.
- ***Fellow*** of the University of Florida's 2024 Advanced Leadership for Academics and Professionals.

Research Experience

CONTRACTS AND GRANTS AWARDED & PENDING

Awarded **Grand Total = $20,262,533**
Awarded **Total My portion =$14,298,919**

A) Active: ***Total Active*** *$3,866,158****; My portion*** *= $2,414,512*

1. *Dual Lead Thalamic Deep Brain Stimulation for Closed Loop Control of Essential Tremor*, Role: PI — 09/30/19-03/31/26
   Mechanism/Sponsor: UH3/NIH-NINDS — Amount: $3,786,158; my portion: $2,334,512

B) Completed ***Total Completed*** *$16,396,375****; My portion*** *= $11,884,407*

2. *Optimizing astronauts' training through mechanistic understanding of neuroplasticity in spaceflights*, Role: PI — *07/01/24-06/30/25*
   Sponsor: Astraeus Space Institute — Amount: $80,000; my portion: $80,000

3. *Interdisciplinary Training Program in Movement Disorders and Neurorestoration* — 07/01/24-06/30/29
   Mechanism/Sponsor: NINDS T32; Role: Mentoring faculty — my portion: $0

4. *Sensory Manipulation as a Countermeasure to Robot Teleportation Delays*, Role: Co-PI (PI: Du) — 4/02/21-12/31/22
   Sponsor: NASA — Amount: $150,000 — my portion: $19,438

5. *Optimizing microstimulation to restore lost somatosensation* — 07/01/15 - 06/30/21
   Role: PI — Amount: $ 1,538,475
   Mechanism/Sponsor: R01/NIH-NINDS — my portion: $1,538,475

6. *Neuromodulation-based treatment of diabetes: identifying anatomical and physiological pancreatic innervation targets* — 09/28/20-07/31/20
   Role: Co-I (Campbell-Thompson, PI, UF) — Amount: $1,705,137
   Mechanism/Sponsor: OT3/NIH-SPARC — my portion: $372,388

7. *Combining Deep Neural Networks and Large-Scale Brain Data to Predict Human Cognition and Behavior*, Role: Co-PI (PI: Odegaard) — *01/01/21-12/31/21*
   Sponsor: University of Florida — Amount: $50,000 — my portion: $12,388

8. *High resolution functional mapping of cortical dynamics in PD mouse model*, Role: PI — *01/01/19-12/31/19*
   Sponsor: University of Florida — Amount: $ 40,000 — my portion: $ 40,000

9. *Optimized Learning via Peripheral Nerve Stimulation* — 01/01/17 - 08/15/19
   Role: PI — Amount: $ 3,990,000
   Sponsor: DARPA — my portion: $3,990,000

10. *Collaborative Research: IUSE: EHR - Enhancing and Expanding Experiential Learning Modules across Disciplines and Institutions* — 09/01/15-08/31/17
    Role: UF-PI (Kim, PI) — Amount: $158,983
    Sponsor: NSF — my portion: $49,407

11. *A Clinically Viable Brain Machine Interface* — 12/12/11 - 08/31/14
    Role: PI — Amount: $2,678,683
    Sponsor: DARPA — my portion: $1,890,000

12. *A primate model of an intra-cortically controlled functional electrical stimulation prosthesis for grasp* — 07/1/11- 06/30/16
    Role: Co-I (Miller, PI, Northwestern U) — Amount: $2,134,786
    Sponsor: NIH-NINDS — my portion: $50,000

13. *High Speed Brain Machine Interface*, Role: PI — 08/16/13 - 11/30/14
    Sponsor: Michigan Initiative for Innovation and Entrepreneurship — Amount: $ 36,000

14. *A Clinically Viable Brain Machine Interface in a Primate Model of Amputation* — 12/02/13 -11/30/15
    Role: PI — Amount: $50,000
    Sponsor: Michigan State University — my portion: $50,000

15. *A Wireless, Multiscale, Distributed Interface to the Cortex* — 08/15/08 - 07/31/14
    Role: PI — Amount: $ 2,210,452
    Mechanism/Sponsor: R01/ NIH-NINDS — my portion: $2,210,452

16. *High Speed Brain Machine Interface* — 08/16/12 - 08/15/13

Role: PI — Amount: $41,500
Sponsor: Michigan Initiative for Innovation and Entrepreneurship — my portion: $41,500

17. *Mining Large-Scale Neural Ensemble Recordings* — 01/01/09 - 12/31/12
Role: PI — Amount: $954,100
Sponsor: R33, NIH-NINDS — my portion: $954,100

18. *Advanced Microsystems for Neural Information Processing* — 03/01/06 -- 02/28/09
Role: PI — Amount: $355,852
Sponsor: R21/NIH-NINDS — my portion: $355,852

19. *Mining Large-Scale Neural Ensemble Recordings* — 01/15/07 - 12/31/08
Role: PI — Amount: $249,407
Sponsor: R21/NIH-NINDS — my portion: $249,407

20. *Quantitative Biology Modeling Initiative: Cortical Processing of Motor Sequences* — 12/01/04 - 08/30/05
Role: Co-I (PI: Sakai) — Amount: $50,000
Sponsor: Michigan State University — my portion: $25,000

INVITED LECTURES & DISTINGHUISHED SEMINARS (excluding paper presentations)

Total: 60 invited talks (2 keynote speaker, 12 Distinguished Speaker, 45 Regular Seminars)

1. "Learning under the light", Department of Biochemistry and Molecular Biology, University of Florida, December 3rd, 2025 (scheduled)
2. "A tale of two stories: Towards understanding natural and artificial intelligence in health and disease", **Indiana University**, June 16th, 2025
3. "Meta Plasticity and Continual Learning: mechanisms subserving neural circuit reorganization" **Indiana Universit**y, Indianapolis, February 19th, 2025
4. "AI in Space: prediction and countermeasures to preserve astronauts' mental health during long space missions," **AI-Days Symposium, University of Florida**, October 29th, 2024
5. "From Biological Intelligence to AI and Back: Interrogation of Neural Circuit Function and Dysfunction", **Italian Institute of Technology (IIT)**, Genoa, Italy, August, 2nd 2022
6. "From Biological Intelligence to AI and Back: Interrogation of Neural Circuit Function and Dysfunction", **UF Faculty Emerita Professors Seminar series**, Gainesville, April 2022
7. "From Biological Intelligence to AI and Back: Interrogation of Neural Circuit Function and Dysfunction", **Carnegie Mellon University**, Pittsburgh, April 2021
8. "From Biological Intelligence to AI and Back: Interrogation of Neural Circuit Function and Dysfunction", **Institute of Vision, Sorbonne University**, Paris, December 2021
9. "All-optical interrogation of population dynamics: implications for neural circuit function and dysfunction", in ***Using light for targeted interrogation of neural circuits and behaviour*** **Think Tank**, Les Treilles-Nice, France, September 2021
10. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Clinically Viable Bi-directional Neural Interfaces, **IEEE Engineering in Medicine and Biology Symposium**, Honolulu, Hawaii, July 2018
11. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Cognitive Neural Interfaces", **Imperial College, London, UK** August 9th 2017
12. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Clinically Viable Bi-directional Neural Interfaces" **Oxford University, Oxford**, UK, August 8th 2017.
13. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Clinically Viable Bi-directional Neural Interfaces", **University of Sheffield, UK**, August 7th, 2017
14. "Reverse Neural Engineering: *Implications for Clinically Viable Brain Machine Interfaces"* IEEE Workshop on **Advanced NeuroTechnologies for BRAIN Initiative**, San Diego, November 8th, 2016

15. "Optimized Learning via Peripheral Nerve Stimulation" Targeted Neuroplasticity Program, **DARPA PI meeting**, San Diego, November, 9th 2016
16. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" 13th Annual Conference of **Society for Brain Mapping and Therapeutics** (SBMT), Miami, April 2016
17. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" **National Academy of Sciences***,* Kavli Frontiers in Science Symposium, Irvine, CA 11/07/2015
18. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" **McKnight Brain Institute***,* University of Florida, FL, 10/29/2015
19. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" **Department of Biomedical Engineering***,* University of Florida, FL, 10/27/2014
20. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Department of Neurosurgery, Spectrum Health System**, Grand Rapids, MI, 05/21/2014
21. "Clinically Viable Brain Computer Interfaces", *Center for Neural Engineering*, Biomedical Engineering Department, **Columbia University,** 05/05/2014
22. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Cleveland Clinic**, scheduled on 02/27/2014
23. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Department of Neurology & Sparrow Health System**, MSU, East Lansing, MI, 01/15/2014
24. "Conversing with the Brain", **Department of Electrical and Computer Engineering**, University of Florida, FL, 01/04/2014
25. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neuroscience Program*, **Michigan State University**, East Lansing, MI, 10/10/2013
26. "Clinically Viable Brain Machine Interfaces," **MSU Board of Trustees**, East Lansing, MI, 06/21/2013
27. "Dynamics of thalamocortical circuits underlying sensorimotor integration", **Workshop on System Identification in Computational Neuroscience, Paris, France,** 07/17/2013
28. "Conversing with the Sensorimotor Brain", **Yale University, Department of Neurobiology**, New Heaven, USA, 05/10/2013
29. "Challenges in decoding and sensory feedback for limb prosthetic control", 4th International Conference on Neuroprosthetic Devices (ICNPD), **University of Freiburg, Germany**, 11/21/2012
30. "A Clinically Viable Brain Machine Interface" **DARPA PI meeting**, New Orleans, USA, 11/13/2012
31. "Conversing with the Brain", **Max Planck Institute, Tübingen, Germany**, 07/13/2012
32. "A Clinically Viable Brain Machine Interface", **Institute of Microsystems, Albert-Ludwig University of Freiburg, Germany**, 07/11/2012
33. "A Clinically Viable Brain Machine Interface", **Ernst Strüngmann Institute for Brain research, Max Planck Society, Frankfurt, Germany**, 07/10/2012
34. "Optogenetics, Neural Ensemble Recording and Graphical Models: Characterizing Neuroplasticity *in vivo*" **Biomedical Engineering Dept., Boston University,** USA, 04/18/2012
35. "Conversing with the Brain", Media Lab & Biological Engineering Seminar series, **Massachusetts Institute of Technology, USA,** 04/19/2012
36. "Conversing with the Brain" Biomedical Engineering Dept. Seminar Series, **University of New South Wales, Sydney, Australia,** 11/25/2011
37. "Bi-Directional Neural Interfaces for Optimizing Stimulation" **3rd International Conference on Neuroprosthetic Devices (ICNPD), Sydney, Australia**, 11/27/2011
38. "Conversing with the Brain" Electrical Engineering Seminar Series, **University of Southern California, Los Angeles**, 10/04/2011
39. "Reading from and Writing to Cortical Networks" Biomedical Engineering Dept. Seminar Series, **University of Miami, Florida**, USA, 08/02/2011
40. "Graphical Models of Functional and Effective Neural Connectivity", **Joint Statistical Meeting, Miami Beach, Florida**, USA, 08/01/2011
41. "Sparsity in the Brain", **Ecole Polytechnic Federal de Lausanne (EPFL), Swiss Federal Institute of Technology, Lausanne, Switzerland,** 07/21/2011

42. "The Facebook of the Mind: Reading from and Writing to Brain Networks" **Department of Biomedical Engineering, University of Florida**, Gainesville, 03/17/2011
43. "An engineer's view of the brain: can we electronically read and write to the mind?" INSPIRE 2010 **(*Plenary*):** International Conference on information representation and estimation, **University College London, London, UK,** 09/08/2010
44. "Neural Encoding, Decoding and Control: The Quest for Bi-directional Brain Machine/Computer Interfaces", **Institute of Neuroscience, University of Newcastle, UK,** 09/09/2010
45. "Neural Encoding, Decoding and Control: What have we learned from Brain Machine Interface studies" Workshop on Methods of Information Theory in Computational Neuroscience, **19th annual Computational Neuroscience, San Antonio, TX,** USA, 07/30/2010
46. "Neural Encoding, Decoding and Control: What do they have in Common?" Workshop on Beyond Brain Machine Interfaces: From Senses to Cognition, **Neural Interfaces Conference, Long Beach, CA, USA,** 06/19/2010
47. "Synergistic Neural Coding: Implications for Neuroprosthetic Devices and Brain Machine Interfaces", 2nd **International Conference on Neuroprosthetic Devices (ICNPD), Beijing, China**, 02/28/2010
48. "10 years of Brain Machine Interfaces: What's next?" **Department of Neurology, University of Georgia,** USA, 02/23/2010
49. "An Engineer's View of the Brain: Can we electronically Read and potentially Write to the Mind?" Center for Brain Injury and Repair, Department of Neurosurgery, University of Pennsylvania, USA, 04/11/2009
50. Department of Physics and Astronomy, Center for Nanomaterials Design and Assembly, Michigan State University, USA, 10/23/2008
51. "Mining Large-Scale Neural Ensemble Recordings: The Quest of Electronically Reading the Mind", **Center for Integrative Neuroscience and Neuroengineering, University of Chicago,** 06/11/2008
52. "Engineering Large Scale Interfaces to the Nervous System: The Quest of Electronically Reading the Mind" Institute for Translational Neuroscience & Electrical & Computer Engineering, **University of Minnesota, USA,** 05/11/2008
53. "Engineering Large Scale Interfaces to the Nervous System: Can We Electronically Read the Mind?" **Mathematical Biosciences Institute, Ohio State University, USA,** 05/06/2008
54. "How Can We Decode the Micro Scenes of an Unknown Neural Code?" Electrical & Computer Engineering Department, **Georgia Institute of Technology, USA**, 04/21/2007
55. "Mining Large Scale Neural Recordings" Dept. of Computer Science and Engineering, **Oakland University, USA**, 06/10/2007
56. "Neural Engineering: Developing Technology for Reliable Brain Machine Interface Systems," Bio-Diagnostics Research Lab, **Michigan State University, USA,** 03/27/2007
57. "Sensing Neural Ensemble Activity in Resource-Constrained Brain Machine Interfaces" Neuroengineering Lab, Institute for Signal Processing, **University of Lübeck, Germany,** 07/21/2006
58. "Large Scale Interfaces for Continuous Monitoring and Selective Stimulation of Neuronal Populations in the Brain" Cognitive Neuroscience Program seminar series, **Michigan State University,** 04/16/2005
59. "Towards Understanding the Micro-Environment of the Brain: Biologically Inspired Neuroprosthetics: Principles & Frontiers" Neuroscience Program Seminar Series, **Michigan State University,** 04/04/2004
60. "Brain Machine Interfaces" College of Engineering seminar series, **Michigan State University,** 12/05/2002

MENTORSHIP ACTIVITY

Summary: 4 Research Assistant Professors (1 tenure track faculty), 10 Postdoctoral fellows (1 fully tenured faculty), 17 PhD students (2 tenured/tenure track faculty), 11 MS students.

Research Assistant Professors

1. **Lila Wollman**, PT, PhD, (2022-2024), University of Arizona, College of Medicine, Department of Physiology (now **Assistant Professor at University of Oregon**) https://cas.uoregon.edu/directory/cas-natural-sciences-faculty/all/lwollman

2. **Zhimin Song**, PhD (2024), "Adaptive Deep Brain Stimulation in Essential Tremor" https://www.linkedin.com/in/z-eric-song-785b64a7/
3. **Yunaxin Chen**, PhD (2022 – 2023) "All optical approach for probing the role of intrinsic excitability in learning and recovery from injury" https://www.linkedin.com/in/yuanxin-chen-250701258/
4. **Narayan Subramanian,** PhD, (2017 – 2020) "Targeted Plasticity Training via Peripheral Nerve Stimulation" https://www.linkedin.com/in/subramaniannarayan/

Postdoctoral fellows

1. **He Zheng**, PhD (2021-2024), "Dual lead thalamic Deep Brain Recording (DBR) and Stimulation (DBS) for control of severe essential tremor" https://www.linkedin.com/in/he-zheng-661800226/
2. **Kazi Alam,** PhD (2023), "Dual lead thalamic Deep Brain Recording (DBR) and Stimulation (DBS) for control of severe essential tremor" https://www.linkedin.com/in/kazi-ashraful-alam-6088a261/
3. **Nicole Chambers**, PhD (2020- 2021) "Dual lead thalamic Deep Brain Recording (DBR) and Stimulation (DBS) for control of severe essential tremor" https://www.linkedin.com/in/nicoleechambers/
4. **Md. Rakibul Mowla**, PhD (2020-2021) "Dual lead thalamic Deep Brain Recording (DBR) and Stimulation (DBS) for control of severe essential tremor" https://www.linkedin.com/in/rmowla/
5. **Zejun Wang, PhD** (2018) **"** Neural Correlates of perceptual learning in prefrontal cortex" https://www.linkedin.com/in/zejun-wang/
6. **Deo Singh, PhD** (2017) "Mapping of Pancreatic Islets Innervation using Two photon Fluorescent imaging", https://www.linkedin.com/in/deo-singh-6a568049/
7. **Erin Purcell, PhD,** (2012-2014) "Artificial tactile feedback for dexterous motor control', Associate Professor, Michigan State University, https://engineering.msu.edu/faculty/Erin-Purcell
8. **Shiying Hao**, **PhD** (2012 – 2014) "Wireless Implantable Microsystems for Neural Interfaces" https://www.linkedin.com/in/shiying-hao-62441a73/
9. **Jianbo Liu, PhD** (2009-2011) "Feedback Control for Optimizing Microstimulation in Bi-directional Brain Machine Interfaces" https://www.linkedin.com/in/jianbo-liu-2a947951/
10. **Fei Zhang, PhD** (2009-2011) "A Wireless neural Interface System for freely behaving subjects" https://www.linkedin.com/in/feizhang0417/

Supervised PhD Dissertations (in chronological order)

a. Current students

1. **Nicholas Rodriguez,** ECE (2025-present): "Multiple time scales in reinforcement learning"
2. **Nisrine Bakri**, ECE (2025-present): "Therapeutic and Longitudinal effects of Deep Brain Stimulation in the human thalamus"
3. **Shuo-Yen Chueh**, ECE (2024-present): "Meta Reinforcement Learning Underlying Cognitive Flexibility"
4. **Sarah Davidson**, ECE (2025-present): "Quantum Foundations of Neural Computation: A Multi-Scale Investigation of Learning and Adaptation"
5. **Michael Bender**, ECE (2024-present): "Prediction of Therapeutic Deep Brain Stimulation Outcomes in Essential Tremor"

b. Past students

6. **Phillip Navarro, PhD,** ECE (2015-2024): "All Optical Network Mapping of Neuronal functional connectivity Using Compressed Sensing"

7. **Benjamin Goolsby**, **PhD,** BME (2016-2022): "Population Dynamics Underlying Sensory Category Discrimination in Posterior Parietal Cortex" https://www.linkedin.com/in/benjamin-goolsby-9578a979/
8. **May Mansy, PhD,** BME (2014-2019): "Fiber photometry for optical monitoring of population activity in deep brain" **Instruction Assistant Professor in BME, UF,** https://www.linkedin.com/in/maymansy/
9. **Ali Mohebi, Ph.D.,** ECE, (2010-2014): "Neural ensemble correlates of cognitive control in the rat medial prefrontal cortex", **Assistant Professor at University of Wisconsin, Maddison, https://ntp.neuroscience.wisc.edu/staff/mohebi-ali/**
10. **Mehdi Aghagolzadeh**, **Ph.D.,** ECE, (2008-2012): "Statistical Signal Processing Tools for Analyzing Large-Scale Neural Ensembles", (Microsoft, Inc.)
11. **Seif Eldawlatly**, **Ph.D.,** ECE, (2006-2011): "Graph-based techniques to infer Functional and Effective Neuronal Connectivity from Spike Train Ensembles", **Full Professor (tenured), American University in Cairo, Egypt** https://www.aucegypt.edu/fac/seif-eldawlatly
12. **Qi-Wei Dong,** ECE (2022-2023) "Optimizing lead target for closed loop Deep Brain Stimulation for Essential tremor"
13. **Naoki Sawahashi,** ECE, (2019-2020): "Dual lead closed loop deep brain stimulation and recording to treat severe Essential Tremor"
14. **Hong Jae Kim,** ECE (2017-2020): "A behavioral platform for mouse virtual navigation"
15. **Brandey Andersen,** BME (2016-2019): "A 4-alternative, forced choice, memory guided task for cognitive control of action selection"
16. **Seyed Mehrdad Hashemi**, ECE, (2013-2016): "Hardware embedding of Lifting-based wavelet transform computation for real time neural interfacing with neural ensembles"
17. **Islam Badreldin,** MS, ECE (2012-2017): "Kernel methods for unsupervised neural decoding in Brain Machine Interfaces"

Supervised M.S Dissertations (in chronological order)

1. **Nicholas Rodriguez,** M.S., ECE (2024-2025): "Behavioral time scale synaptic plasticity for rapid learning"
2. **Michael Bender**, M.S., ECE (2023-2024): "Quantifying motor outcomes in ET human subjects with DBS"
3. **Joseph Canzano,** M.S. BioMedical Sciences(2018-2020): "2-photon imaging of pancreatic Islets during vagus nerve stimulation" (now PhD student at UCSB)
4. **Akhil Perincherry,** M.S., ECE, (2016), "real time tracking of active whisking during tactile-based decision making", (Ford Motor Company: autonomous driving R&D division)
5. **Ahmed Eleryan**, M.S., ECE, (2011-2013): "Stability and tracking of unit activity in cortically controlled Brain Machine Interfaces", (Google, Inc)
6. **Joseph Succar,** M.S., ECE, (2015-2016): "real time tracking of active whisking during detection and discrimination tasks"
7. **Ki Yong Kwon**, M.S., ECE (2008-2010): "NeuroQuest: A comprehensive software package for the analysis of large scale neural ensemble recordings", (Plexon Inc, Dallas, TX)
8. **Esraa El-Sharoa**, M.S., ECE (2007-2008): "Augmenting information channels in cochlear Implants under adverse conditions"
9. **Kyle Thomson**, M.S, ECE (2006-2008): "Hardware considerations for implantable neural interface system design"
10. **Yasir Suhail**, M.S., ECE (2003-2005): "Methods for processing and analysis of multichannel neural recordings"

11. **Michael Brodsky**, MS, BME (2016-2018): "Characterization of 6-OHDA parkinsonian rat model in goal directed behavior"

Undergraduate students with final projects (selected from a total of 57 students)

Lauren Goldman, BS Biotech, 2025**, Isabella Fernandez,** BS biology 2025**, Chloe Lapish,** BS, BME, Spring 2024, **Emmalee Brown,** BS, ECE, Summer 2023, **Ivan Mihanovic,** BS, ECE, Summer 2023, **Jacob Frieden,** BS, ECE, Summer 2022, **Gwynne Buxton,** BS, ECE, Summer 2022, **Sadat Uddin**, BS, BME, 2022, **Cooper Adams**, BS, ECE, 2021, **Kyle Scheller**, BS, Biology, 2019 **Abdul Rahman Seddiqui, BS,** Biology, 2019**, Elliot Spector,** BS, Neuroscience, 2015, **Orlando Murray**, UG, BE, ECE university of Florida, 2016, **Mark McNeeley**, UG, ECE, university of Florida, Spring, Summer and Fall 2016, **Megan Parsons,** A.B. Neurobiology Honors UG candidate, Harvard University, Summer 2015, **Lee Elisevich,** BS, BME, University of Michigan, Summer 2014, **Dylan Miller**, BS, neuroscience major, Fall 2013 – Spring 2014, **Matthew Barringer**, BS, BME, Fall 2013– Spring 2014, **Samuel Akwei-Sekyere**, UG Neuroscience major, Fall 2012 – Spring 2014, **Hannah Batchelor**, BS, Neuroscience major, Fall 2012, **Marissa Zoratti**, BS, Neuroscience major, Fall 2012 – Fall 2014, **Caitlin Slicker**, ECE, Spring 2013.

Teaching

** denotes new courses I have offered*

Undergraduate Level

1)	*Bioelectrical Systems* (Senior)*	Fall '15,'16,'17, '18,'19; Spring'22, '23, '24
2)	*Linear Circuits* (Sophomore)	Spring'03
3)	*Electrical Circuits & Systems II* (Sophomore)	Spring'09, Fall'09
4)	*Circuits and Systems* (Junior)	Spring'04
5)	*Introduction to Signal Processing* (Sophomore)	Fall'04, Spring'07, Fall'07
6)	*Senior Capstone Design*	Fall'06, '07, '08,'12

Graduate Level

1)	*Neural Signals, Systems and Artificial Intelligence**	Spring '15, '16, '17, '18, '19, '20, Fall '22, 23
2)	*Neural Engineering and Brain Machine Interfaces**	Spring '08,'12,'13, Fall'10,'12
3)	*Biology of Sensory Systems*	Spring *'16, 18*
4)	*Systems Neuroscience: Motor Systems*	Spring '08, '09, '10, '12, '13
5)	*Linear Control Systems*	Fall '02
6)	*Detection and Estimation Theory*	Spring '04,'05,'06
7)	*Advanced Signal and Array Processing*	Fall'05

*** Teaching Evaluations (Average over past 5 years):**

- Graduate Instruction Overall rating: **4.63** (ECE Dept mean 4.46, College of Engineering mean 4.43)
- Undergraduate Instruction Overall rating: **4.23** (ECE Dept mean 4.26, College of Engineering mean 4.18)

Service

Editorial Activities for Scholarly Journals

Editor, *Statistical Signal Processing for Neuroscience & Neurotechnology*, 1st edition, Academic Press, Elsevier, 2010 (4.8/5 review rating on Amazon.com)

Consulting Editor, Academic Press, Elsevier, Biomedical Engineering Book Series, 2012 - present

Associate Editor, IEEE Transactions on *Neural Systems & Rehabilitation Engineering*, 2012–2020

Associate Editor, IEEE Signal Processing Letters, 2009 – *present*

Review Editor, Journal of *Frontiers in Neuroscience***,** 2015 – *present*

Review Editor, Journal of *Frontiers in Neural Engineering,* 2009 - *present*

Associate Editor, Journal of *Computational Intelligence and Neuroscience*, 2006 – 2012

Section Editor, *Springer Encyclopedia of Computational Neuroscience*: Brain Machine Interfaces, 2013 – present

Theme Editor, IEEE Eng. in Med & Bio. Conference (EMBC) Editorial Board: Neural & Rehabilitation Engineering, 2012 – 2020

Associate Editor, IEEE Eng. in Med & Bio Conference (EMBC) Editorial Board: Neural & Rehabilitation Engineering, 2010 – 2012

Guest Editor, EURASIP Journal on Advances in Signal Processing, 2008 -2010

Guest Editor, Journal of Computational Intelligence and Neuroscience, 2008-2010

Member, IEEE Signal Processing Society (SPS) Board of Directors' initiative on Brain Machine Interfaces 2006-08

Member, IEEE Technical Committee on Biomedical Circuits and Systems; IEEE Technical Committee on Life-Science Systems and Applications; IEEE Technical Committee on Neural Systems and Applications**;** IEEE Engineering in Medicine and Biology Society

2024 – present, Member, American Association for the Advancement of Science (AAAS)
2004 – present, Member, Society for Neuroscience

Grant, Committee, Panel and Scholarly Journal Peer Review Activities

1. ***Standing Study section member for the BRAIN initiative, U01, U19, UH1, RM1*** **(2015-present)**
2. ***Standing Member,*** **Department of Veterans Affairs** RR&D Scientific Merit Review Board (10/2015 – present)
3. ***Standing Member***, **NIH Study Section on Neurotechnology** (NT) (07/01/2010 – 06/30/2014)
4. ***Standing Member*** of **NIH study section on Bioengineering of Neuroscience, Vision, and Low Vision Technologies** (BNVT) (01/01/2012 – 06/30/2014)
5. ***Standing Member*****,** Dept. of Veterans Affairs Rehabilitation Research and Development Service Spinal Cord Injury and Neuropathic Pain panel (2015- 2024)
6. ***Standing Member*** - **NIH**: BRAIN U54 BluePrint Medtech Center (2023), BRAIN U19 Center of Excellence (2017, 2020, 2023), NIH Big-Data-To-Knowledge (BD2K) Initiative (2022), NINDS Institutional Center Core Grants to Support Neuroscience Research (P30) (2021), High Impact Neuroscience Research Resource Grants (R24) (2020), NIH Director's Independence Award program (2019), Clinical Neurophysiology, Devices and Neuroprosthetics/Brain Disorders (2021), NIH Ruth Kerstein Service Award (F30, F31, F32) (2013-2022), Neuroinformatics, NIH Human Brain Project, NIH special emphasis panel on Continued Development and Maintenance of Software, ARRA Challenge Grants on Bioengineering Sciences and Technology, Emerging Technologies and Training in Neurosciences, NIH/NIBIB Career Development Award (K01, K99)
7. ***Panelist*** NSF Collaborative Research on Computational Neuroscience program, 2022, 2023, 2024
8. ***Panelist*** NSF AI for Smart Health, 2023, 2024
9. ***Panelist,*** **Department of Defense** (DoD) Congressionally Directed Medical Research Program (CDMRP)-Spinal Cord Injury (2010 – *present*)
10. ***Panelist***, **Department of Defense** (DoD) Congressionally Directed Medical Research Programs (CDMRP)-Orthotics and Prosthetics Outcomes Research Program (OPORP) (2022, 2023)
11. ***Reviewer,*** *Oak Ridge Associated Universities (ORAU) program*, Pennsylvania Department of Health (PA DOH) 2015, 2019, 2020, 2021, 2022.
12. ***Reviewer,*** *Industry and Networking (GAIN) program,* South Carolina's Comprehensive Research Universities**,** 2025.
13. ***Reviewer,*** for the European Career Development Award Program, Human Frontier Science Program Organization (HFSPO), Strasbourg, France (2013)

14. ***International Reviewer:*** The American Institute of Biological Science (2020), The Maryland Technology Development Corporation (TEDCO) (2019), The Dutch Technology Foundation for academic research in applied sciences (2022), the Qatar Technology Foundation, The Office of VP for Research & Grad Studies Research Grants Program at UF and MSU, University of Florida's College of Engineering Research Grants Program.
15. ***Paper Referee for the following Journals****:* Nature, Nature Neuroscience, Nature Biomedical Engineering, Neuron, Proceedings of the National Academy of Science (PNAS), Proceedings of the Public Library of Science (PLoS ONE), Journal of Neuroscience, Frontiers in Neuroscience, Frontiers in Computational Neuroscience, Frontiers in Neural Engineering, Frontiers in Systems Neuroscience, Journal of Neural Engineering, Journal of Neural Computation, Journal of Neuroscience Methods, Journal of Computational Neuroscience, Journal of Neuroinformatics, Journal of Neurocomputing, Journal of Computational Intelligence and Neuroscience, EURASIP Journal of Advances in Signal Processing, EURASIP Journal on Embedded Systems, Journal of the Royal Society Interface, Artificial Intelligence in Medicine, IEEE Sensors, IEEE Transactions on Biomedical Engineering, IEEE Trans. on Neural Systems and Rehabilitation Engineering, IEEE Transactions on Signal Processing, IEEE Trans. on Biomedical Circuits & Systems, IEEE Transactions on Systems, Man and Cybernetics, IEEE Signal Processing Letters, IEEE Signal Processing Magazine, IEEE Trans. on Circuits and Systems.

Activities in Organizing Professional Conferences

2015 National Academy of Science/Kavli Frontier of Science Symposium Organizer and Chair (Invited): "Reverse Engineering the Brain with Brain Computer Interfaces", Irvine, California
2013 *Minisymposium co-organizer and co-chair*: 35th IEEE Engineering in Medicine & Biology Conference: "Bidirectional neural interfaces with the sensorimotor system", Osaka, Japan
2013 *Minisymposium co-organizer and co-chair*: 35th IEEE Engineering in Medicine & Biology Conference: "Bidirectional neural interfaces with the sensorimotor system", Osaka, Japan
2011 *Minisymposium organizer and Chair*: 33rd IEEE Engineering in Medicine & Biology Conference: "Optogenetics: novel tools for probing and manipulating neural circuits", Boston, MA
2011 Co-chair: Neuro-Nanotech theme, 5th International IEEE EMBS Conference on *Neural Engineering, Cancun, Mexico*
2010 *Track Chair*: 32nd IEEE Engineering in Medicine & Biology Conf.: "Analysis of Neural Signals",
2010 *Session Chair:* 32nd IEEE Engineering in Medicine & Biology Conf. "Estimation of Brain Connectivity" and "Brain Stimulation"
2010 *Workshop leader:* 4th International meeting on Brain Computer Interface: "Using BCI Systems to Induce Neural Plasticity and Restore Function", Asilomar, CA
2009 *Session Chair:* 43rd IEEE Asilomar Con. on Signals, Systems & Computers: "Neural Signal Processing"
2009 *Session Chair:* 34th IEEE ICASSP: "Signal Processing for Neural Spike Trains"
2008 *Session Organizer and Chair:* 33rd IEEE ICASSP: "Revamping Signal Processing for Neuroscience: Challenges in Brain Machine Interface Technology"
2006 *Session chair:* 28th IEEE Engineering in Medicine & Biology Conference: "Neural Microsystems and Instrumentation"

INSTITUTIONAL SERVICE

2022 – 2024	Graduate Admission and Recruitment Chair, ECE Department
2023	Faculty Search Committee, Dept of Psychology, University of Florida
2021	Faculty Search Committee, Biomedical Engineering Dept, Top AI initiative
2021	Faculty Search Committee, Dept of Applied Physiology and Kinesiology, Top AI initiative
2021	Faculty Search Committee, ECE Dept, Top AI initiative
2016 – 2020	Faculty Search Committee, College of Engineering, University of Florida
2018 – 2022	Undergraduate Studies Committee, College of Engineering, University of Florida
2015 – 2018	Graduate Studies Committee, College of Engineering, University of Florida
2015 –	Curriculum Committee, IDP program, College of Medicine, University of Florida

2013 – 2014 College of Engineering Intellectual leader, MSU Task force on concept paper for the Broad BRAIN Institute initiative
2013 – 2014 Member, Cognitive Science Program Advisory Committee
2013 – 2014 Member, Neuroscience Program Graduate Affairs Committee
2010 – 2012 Member, ECE Graduate Studies Committee
2008 – 2012 Member, ECE Graduate Admissions Committee
2007 – 2008 Member, ECE Undergraduate Studies Committee
2004 – 2007 Member, Institutional Review Board (IRB) overseeing Research Involving Human Subjects
2005 – 2007 Member, University Appeals Board
2005 – 2007 Member, ECE Graduate Studies Committee
2003 – 2006 Member, ECE Faculty Search Committee

PUBLICATIONS

Referred Journal Manuscripts (Published)

J1. Shuo-Yen Chueh, et. Al. **(2025)** "Metaplasticity and Continual Learning: Mechanisms subserving Brain Computer Interface Proficiency," ***J. Neural Engineering***, 2025 May 23;22(3):036020. doi: 10.1088/1741-2552/add37b

J2. I-Wen Chen, et al. **(2025)** "*High-throughput synaptic connectivity mapping using in vivo two-photon holographic optogenetics and compressive sensing*", ***Nature Neuroscience***, doi: 10.1038/s41593-025-02024-y

J3. E. Benevides, P. Thakre, S. Rana, M. Sunshine, V. Jensen, **K Oweiss**, David Fuller, **(2024)** "Chemogenetic stimulation of phrenic motor output and diaphragm activity" ***eLife***, https://doi.org/10.7554/eLife.97846.2

J4. P. Navarro, **K. Oweiss** (2023), "Compressive sensing of neuronal connectivity maps from subsampled, cell-targeted optogenetic stimulation," ***Patterns, Cell Press***, volume 4, issue 10 https://doi.org/10.1016/j.patter.2023.100845

J5. S. Akella, A. Mohebi, J. Principe, **K Oweiss** (2021), "Marked point process representation of oscillatory dynamics underlying working memory" ***J. Neural Eng*. 18 (2) 026016**

J6. M. Vaidya, K. Balasubramanian, J. Southerland, I. Badreldin, A. Eleryan, K. Shattuck, S. Gururangan, M. Slutzky, L. Osborne, A. Fagg, N. Hatsopoulos, **K G Oweiss** (2018), "Emergent Coordination Underlying Learning to Reach-to-Grasp with a Brain-Machine Interface", ***J. Neurophysiology*,** 119, 4, 1291-1304

J7. K Balasubramanian, M Vaidya, J Southerland, I Badreldin, A Eleryan, M. Slutzky, A. Fagg, **K G Oweiss***, N. Hatsopoulos*, (2017) 'Changes in cortical network connectivity with long-term brain-machine interface exposure after chronic amputation', ***Nature communications* 8 (1), 1796.** (* equally contributing)

J8. P. Justin Rossi, ..., **K. Oweiss**, et al. (2016) "The Third Annual Deep Brain Stimulation Think Tank: A Review of Emerging Issues and Technologies", ***Frontiers in Neuroscience,*** Vol 10, doi: 10.3389/fnins.2016.00034

J9. A Laine, …, **K. Oweiss,** et al. "IEEE Workshop on Advanced NeuroTechnologies for BRAIN Initiatives", **IEEE Pulse**, Volume: 7, Issue: 5**,** Sept.-Oct. 2016

J10. **K. Oweiss**, and I. Badreldin (2015) "Neuroplasticity subserving the operation of brain–machine interfaces." ***J. Neurobiology of disease* 83: 161-171.**

J11. S. Eldawlatly, **K. Oweiss**, (2014) "Temporal precision in population - but not individual neuron - dynamics reveals rapid experience-dependent plasticity in the rat barrel cortex" ***Frontiers in Computational Neuroscience,*** Vol 8, doi: 10.3389/fncom.2014.00155

J12. A. Eleryan, M. Vaidya, J. Southerland, I. Badreldin, K. Balasubramanian, A. Fagg, N. Hatsopoulos, and **K. Oweiss** (2014) "Tracking Single Units in Chronic Recordings in the Macaque Motor Cortex for Brain Machine Interface Applications", ***Frontiers in Neural Engineering* 7:23.** doi:10.3389/fneng.2014.00023

J13. **K. Oweiss** (Section Editor) (2014) "Brain Machine Interface: Overview" in ***Springer Encyclopedia of Computational Neuroscience*** (Dieter Jaeger & Ranu Jung, Eds), Springer Verlag

J14. I. Badreldin, **K. Oweiss** (2014) "Neural Decoding" in ***Springer Encyclopedia of Computational Neuroscience*** (Dieter Jaeger & Ranu Jung, Eds), Springer Verlag

J15. M Aghagolzadeh, A Mohebi, **K. Oweiss** (2014), Sorting and tracking neuronal spikes via simple thresholding," ***IEEE Transactions on Neural Systems and Rehabilitation Engineering*****, 22:4,** pp 858 - 869

J16. A. Mohebi, **K. Oweiss**, (2013) "A fully automated rodent conditioning protocol for sensorimotor integration and cognitive control experiments," ***J.Visualized Experiments***

J17. J. Daly, J. Liu, M. Aghagolzadeh, **K. Oweiss** (2012), "Optimal Space Time Precoding of Artificial Sensory Feedback through Mutichannel Microstimulation in Bi-directional Brain Machine Interfaces " ***J. Neural Engineering*****, 9, 065004,** doi:10.1088/1741-2560/9/6/065004

J18. F. Zhang, M. Aghagolzadeh, and **K. Oweiss**, (2012) "A Fully Implantable, Programmable and Multimodal Neuroprocessor for Wireless, Cortically Controlled Brain-Machine Interface Applications," ***J. Signal Processing Systems*****, pp. 1-11**, doi:10.1007/s11265-012-0670

J19. K.Y. Kwon, S. Eldawlatly, **K. Oweiss** (2012)"NeuroQuest: A Comprehensive Analysis Tool for Extracellular Neural Ensemble Recordings," ***J. Neuroscience Methods*** *204, 189– 201*

J20. S. Eldawlatly, **K. Oweiss** (2011) "Millisecond-Timescale Local Network Coding in the Rat Primary Somatosensory Cortex," ***PLoS ONE*** **6(6): e21649.** doi:10.1371/journal.pone.0021649

J21. J. Liu, H. Khalil, **K. Oweiss** (2011)"Neural Feedback for Instantaneous Spatiotemporal Modulation of Afferent Pathways in Bi-directional Brain Machine Interfaces," ***IEEE Transactions on Neural Systems & Rehabilitation Engineering,*** **19:5, pp 521-533**, doi: 10.1109/TNSRE.2011.2162003

J22. J. Liu, H. Khalil, **K. Oweiss** (2011)"Model-based analysis and control of a network of Basal Ganglia spiking neurons in the normal and Parkinsonian states," ***J. Neural Engineering****,* 8: 045002

J23. M. Grosse-Wentrup, D. Mattia, **K. Oweiss** (2011), "Using Brain-Computer Interfaces to Induce Neural Plasticity and Restore Function," ***J. Neural Engineering****,* 8: 025004

J24. M. Aghagolzadeh, S. Eldawlatly and **K. Oweiss**, (2010) "Synergistic Coding by Cortical Neural Ensembles" ***IEEE Transactions on Information Theory***, 56:2, pp. 875-899

J25. S. Eldawlatly, Y. Zhou, R. Jin and **K. Oweiss**, (2010) "On The Use of Dynamic Bayesian Networks in Reconstructing Functional Neuronal Networks from Spike Train Ensembles**",** ***J. Neural Computation*****,** MIT Press, 22:1, pp. 158-189

J26. **K. Oweiss**, M. Aghagolzadeh (2010) **"**Detection and Classification of Extracellular Action Potential Recordings," in ***Statistical Signal Processing for Neuroscience and Neurotechnology (Ch.2)*** *- K. Oweiss (Editor)*, Academic Press, Elsevier, pp. 13-68, ISBN: 978-0-12-375027-3

J27. S. Eldawlatly, **K. Oweiss**, (2010) "Graphical Models of Functional and Effective Neuronal Connectivity," in ***Statistical Signal Processing for Neuroscience and Neurotechnology****, (Ch. 5) - K. Oweiss* (*Editor*), Academic Press, Elsevier, pp. 119-159, ISBN: 978-0-12-375027-3

J28. T. W. Berger, Z. Chen, A. Cichocki, **K. Oweiss**, R. Quian Quiroga, and N. V. Thakor, (2010) "Signal Processing for Neural Spike Trains," ***J. Computational Intelligence and Neuroscience****,* Volume 2010, Article ID 698751, 2 pages, doi:10.1155/2010/698751

J29. **K. Oweiss,** J. Principe and D. Johnson, (2009) "Statistical Signal Processing in Neuroscience", ***EURASIP Journal on Advances in Signal Processing***, Volume 2009, Article ID 105086, 1 page, doi:10.1155/2009/105086

J30. M. Aghagolzadeh and **K. Oweiss**, (2009) "Compressed and Distributed Sensing of Neuronal Activity for Real Time Spike Train Decoding", ***IEEE Transactions on Neural Systems & Rehabilitation Engineering***, 17:2, pp. 416-427

J31. S. Eldawlatly, R. Jin, and **K. Oweiss**, (2009) "Identifying Functional Connectivity in Large Scale Neural Ensemble Recordings: A Multiscale Data Mining Approach", ***J. Neural Computation****,* MIT Press, 21:2, pp. 450-477

J32. M. Kamboh, A. Mason and **K. Oweiss**, (2008) "Analysis of Lifting and B-Spline DWT Implementations for Implantable Neuroprosthetics," ***J. Signal Processing Systems***, 52:3, pp. 249-261

J33. Kamboh, M. Raetz, **K. Oweiss**, A. Mason, (2007) "Area-Power Efficient VLSI Implementation of Multichannel DWT for Data Compression in Implantable Neuroprosthetics," ***IEEE Transactions Biomedical Circuits and Systems***, 1:2, pp. 128-135

J34. **K. Oweiss**, A. Mason, Y. Suhail, A. Kamboh, K. Thomson (2007) "A Scalable Wavelet Transform VLSI Architecture for Real-Time Signal Processing in High Density Intra-cortical Implants," ***IEEE Transactions on Circuits and Systems***, 54:6, pp. 1266-1278

J35. **K. Oweiss**, and D. Anderson, (2007) "Tracking Signal Subspace Invariance for Blind Separation and Classification of Nonorthogonal Sources in Correlated Noise," ***EURASIP Journal on Advances in Signal Processing***, vol. 2007, Article ID 37485, 20 pages

J36. **K. Oweiss**, R. Jin, Y. Suhail, (2007) "Identifying neuronal assemblies with local and global connectivity with spectral clustering in scale space" ***J. Neurocomputing*****,** 70:10-12, pp. 1728-1734

J37. **K. Oweiss**, (2006) "A Systems Approach for data compression and latency reduction in cortically-controlled brain machine interfaces," ***IEEE Transactions on Biomedical Engineering***, 53:7, pp. 1364 – 1377

J38. **K. Oweiss**, D. J. Anderson (2006) "Spike Superposition Resolution In Multichannel Extracellular Neural Recordings: A Novel Approach," ***in Handbook of Neural Engineering*** (Ch. 22) – M. Akay, (*Editor*), Wiley-IEEE Press, pp. 369-381, ISBN: 978-0-470-05669-1

J39. **K. Oweiss**, D.J. Anderson, (2002) "Spike Sorting: A Novel Shift and Amplitude Invariant Technique**," *J. Neurocomputing***, Vol 44-46, pp. 1133-1139

J40. **K. Oweiss**, D.J. Anderson, (2001) "Noise Reduction in Multichannel Neural Recording using a New Array Wavelet Denoising Algorithm," ***J. Neurocomputing***, Vol. 38-40, pp. 1687-1693

Pre-print Journal manuscripts Published

J41. S. Akella, et al. (2025) "Enhancing information extraction from field potentials in electrophysiology studies" bioRxiv, https://doi.org/10.1101/2024.11.18.624059

J42. Shuo-Yen Chueh et al. (2025) "Metaplasticity and Continual Learning: Mechanisms subserving Brain Computer Interface Proficiency," *bioRxiv*, https://doi.org/10.1101/2025.03.22.644643

J43. Ido Aizenbud, et al. (2025) "Neural mechanisms of predictive processing: a collaborative community experiment through the OpenScope program", *arXiv preprint, https://doi.org/10.48550/arXiv.2504.09614*

J44. I-Wen Chen, Chung, Y Chan, P Navarro, V de Sars, E Ronzitti, D Tanese, K Oweiss & V Emiliani (2023) "In Vivo high-thoughput probing of synaptic connectivity using two-photon holographic optogenetic stimulation and compressed sensing strategies", *bioRxiv,* https://doi.org/10.1101/2023.09.11.557026

J45. E. Benevides, (2024) "Chemogenetic stimulation of phrenic motor output and diaphragm activity" *bioRxiv* https://doi.org/10.1101/2024.04.12.589188

J46. A Mohebi, K Oweiss (2022) "Lateralized role of prefrontal cortex in guiding orienting behavior", *bioRxiv*, https://doi.org/10.1101/2020.04.12.038356;

J47. JS Canzano, (2019) "in vivo two-photon imaging and parasympathetic neuromodulation of pancreatic microvascular dynamics in rats", *bioRxiv,* https://doi.org/10.1101/2020.10.26.355669

Books, Book Chapters, Dissertations

J48. **K. Oweiss,** (2010) *Statistical Signal Processing for Neuroscience and Neurotechnology*, Academic Press, Elsevier, 1st edition, pp. 1-11, ISBN: 978-0-12-375027-3

J49. **K. Oweiss** (2002), *Multiresolution Analysis of Multichannel Neural Recordings in the Context of Signal Detection, Estimation and Noise Suppression, Ph.D. Dissertation*, Univ. of Michigan, Ann Arbor

J50. I. Badreldin, I.S., **K. Oweiss** (2022). Neural Decoding. In: Jaeger, D., Jung, R. (eds) *Encyclopedia of Computational Neuroscience. Springer, New York, NY; Pages 2213-2225*; https://doi.org/10.1007/978-1-0716-1006-0_559

K. Oweiss, (2022). Brain-Machine Interface: Overview. In: Jaeger, D., Jung, R. (eds) *Encyclopedia of Computational Neuroscience. Springer, New York, NY; Pages 12-19*; https://doi.org/10.1007/978-1-0716-1006-0_783

Refereed Full Length Conference Papers

C1. M. Bender, H. Zheng, D. Vaillancourt, A. Ramirez, K. Foote, **K. Oweiss** et al. (2025) "Thalamic Spectral and Connectivity Biomarkers for Adaptive Deep Brain Stimulation in Essential Tremor, in *IEEE Int. Conf. On Neural Engineering (NER),*

C2. M. Bender, H. Zheng, D. Vaillancourt, A. Ramirez, K. Foote, **K. Oweiss** et al. (2025) "Evaluating Thalamic Biomarkers for Closed-Loop Deep Brain Stimulation in Essential Tremor", in *Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*,

C3. S. Akella, A. Mohebi, K. Riels, A. Keil, **K. Oweiss** and J. C. Principe, (2021) "Local power estimation of neuromodulations using point process modeling," in *10th International IEEE/EMBS Conf. on Neural Engineering (NER)*, pp. 420-425.

C4. M. Mansy, H Kim, and **K. Oweiss** (2019) "Spatial detection characteristics of a single photon fiber photometry system for imaging neural ensembles." *in 9th Int. IEEE/EMBS Conf. on Neural Engineering (NER)* pp. 969-972.

C5. I. Badreldin, **K. Oweiss**, (2014), "A Design and Implementation Framework for Unsupervised High-resolution Recursive Filters in Neuromotor Prosthesis Applications," *48th Asilomar Conference on Signals, Systems, and Computers*, pp. 776-780.

C6. I. Badreldin, J. Southerland, M. Vaidya, A. Eleryan, K. Balasubramanian, A. Fagg, N. Hatsopoulos, **K. Oweiss**, (2013) "Unsupervised Decoder Initialization for Brain-Machine Interfaces Using Neural State Space Dynamics," *IEEE Int. Conf. Neural Engineering*, pp. 997-1000

C7. A Eleryan, M. Vaidya, I. Badreldin, J. Southerland, K. Balasubramanian, A. Fagg, N. Hatsopoulos, **K. Oweiss** (2013) "Tracking Chronically Recorded Single-Units in Cortically Controlled BMIs," *IEEE Int. Conf. Neural Engineering*, pp. 427-430

C8. J. Daly, E. Purcell, M. Zoratti, **K. Oweiss**, (2013) "Control of Somatosensory Cortex Via Optogenetic Stimulation of Motor and Thalamic Pathways," *Transactions of Japanese Society for Medical and Biological Engineering, 51, no. Supplement (2013): M-74*

C9. K. Balasubramaniam, J. Southerland, M. Vaidya, K. Quan, A. Eleryan, A. Fagg, M. Slutzky, **K. Oweiss**, N. Hatsopoulos, (2013) "Operant conditioning of a multiple degree-of-freedom brain-machine interface in a primate model of amputation," in *35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) (pp. 303-306)*

C10. I. Badreldin, **K. Oweiss**, (2012) "Performance Evaluation of Linear Brain Machine Interface Decoders in Neural State Space," in *Proc. of IEEE Cairo Int. Conf. on Biomedical Engineering*, pp. 10-13

C11. J. Liu**,** H. Khalil, **K. Oweiss,** (2011) "Model-Based Spatiotemporal Analysis and Control of a Network of Spiking Basal Ganglia Neurons" in *Proc. IEEE Int. Conf. on Neural Engineering,* pp. 273 – 277

C12. M. Aghagolzadeh, **K. Oweiss,** (2011) "An Adaptive Wireless Communication Protocol for Neural Data Transmission in Freely Behaving Subjects" in *Proc. IEEE Int. Conf. on Neural Engineering,* pp. 404 – 407

C13. F. Zhang, M. Aghagolzadeh, **K. Oweiss**, (2011) "A Low-Power Implantable Neuroprocessor on Nano-FPGA for Brain Machine Interface Applications" in *Proc of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 1593 – 1596

C14. **K. Oweiss,** (2011) "Optogenetics, Neural Ensemble Recordings and Graphical Models: Characterizing Plasticity in Neuronal Networks *in vivo*," in *Proc. of IEEE 35th Engineering & Biology* Society

C15. **K. Oweiss,** (Invited) (2011) "Brain Machine Interfaces for personalized neurological diagnostics and therapy" *Journal of Cyber Therapy and Rehabilitation,* 4:1, pp. 38 (ISSN: 1784-9934)

C16. K.Y. Kwon, **K. Oweiss**, (2011) "Wavelet footprints for detection and sorting of extracellular neural action potentials", in *Proc of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 609 – 612

C17. A. M. Kamboh, Y. Yang, **K. Oweiss** and A. J. Mason, (2011) "Channel Characterization for Implant to Body Surface Communication," in *Proc IEEE International Symposium on Circuits and Systems* (ISCAS), pp. 913 – 916

C18. F. Zhang, M. Aghagolzadeh, **K. Oweiss**, (2010) "An Implantable Neuroprocessor for Multichannel Compressive Neural Recording and on-the-Fly Spike Sorting with Wireless Telemetry" in *Proc. IEEE Biomedical Circuits and Systems,* pp. 1-4

C19. J. Liu, **K. Oweiss,** H. Khalil, (2010) "Feedback Control of the Spatiotemporal Firing Patterns of Neural Microcircuits," in *Proc. of 49th IEEE Conference on Decision and Control* (CDC), pp. 4679 – 4684

C20. S. Eldawlatly and **K. Oweiss,** (2010) "Causal Networks Provide Functional Signature of Stimulus Encoding in the Rat Barrel Cortex", in *Proc. 31st IEEE Eng. in Medicine and Biology (EMBC),* pp. 5460 – 5463

C21. M. Aghagolzadeh, F. Zhang, and **K. Oweiss**, (2010) **"**An Implantable VLSI Architecture for Real Time Spike Sorting In Cortically Controlled Brain Machine Interfaces," in *Proc. 31st IEEE Eng. in Medicine and Biology (EMBC),* pp. 1569 – 1572

C22. A. Kamboh, Y. Yang, **K. Oweiss**, A. Mason, (2010) "Design of a Configurable Neural Data Compression System for Intra-Cortical Implants," in *Proc. of IEEE Int. Symp. on Circuits & Systems (ISCAS)*, pp. 3473– 3476

C23. M. Aghagolzadeh, S. Eldawlatly, and **K. Oweiss** (2009) "An Information Theoretic Approach to Identify the Role of Higher-order Interactions between Cortical Neurons in Stimulus Coding " *in Proc. 43rd Asilomar IEEE Int. Conference on Signals, Systems, and Computers,* Pacific Grove, CA, pp. 1085-1089

C24. M. Aghagolzadeh, S. Eldawlatly, and **K. Oweiss**, (2009) "Coding Stimulus Information with Cooperative Neural Populations," in *Proc. of IEEE Int. Symposium on Information Theory*, pp. 1594 – 1598

C25. S. Eldawlatly, Y. Zhou, R. Jin, **K. Oweiss**, (2009) "Inferring Functional Cortical Networks from Spike Train Ensembles using Dynamic Bayesian Networks," in *Proc of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 3489-3492

C26. M. Aghagolzadeh, **K. Oweiss**, (2009) "Instantaneous rate estimation of Neuronal Point processes from a Compressed representation of their non-binary spike trains " in *Proc IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), pp. 1593 – 1596

C27. A. M. Kamboh, **K. Oweiss**, A. Mason, (2009) "Resource Constrained VLSI Architecture for Implantable Neural Data Compression Systems," *Proc. of IEEE Int. Symp. On Circuits & Systems (ISCAS)*, pp. 1481 - 1484

C28. F. Abu-Nimeh, F. Inanlou, M. Aghagolzadeh, A. Kamboh, A. Mason, M. Ghovanloo, and **K. Oweiss**, (2009) "A highly modular, wireless, Implantable Interface to the Cortex," in *Proc. IEEE Int. Conf. on Neural Engineering*, 375 – 378

C29. M. Aghagolzadeh, S. Eldawlatly, **K. Oweiss**, (2009) "Identifying Functional Connectivity of Motor Neuronal Ensembles Improves the Performance of Population Decoders," in *Proc. IEEE Int. Conf. on Neural Engineering*, pp. 534 – 537

C30. K.Y. Kwon, S. Eldawlatly and **K. Oweiss**, (2009) "NeuroQuest: A Comprehensive Tool for Large Scale Neural Data Processing and Analysis" in *Proc. IEEE Int. Conf. on Neural Engineering*, pp. 622 – 625

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