Karim G. Oweiss

Biographical Information

Personal Information

Office Contact: University of Florida
Department of Electrical and Computer Engineering
457 NEB, 1064 Center Dr., Gainesville, FL 32611-6130
Phone: (352) 294-1898; Fax: (352) 392-0044
Email: koweiss@ufl.edu

EDUCATION

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

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

2014 – **Professor (affiliate)**, Department of Biomedical Engineering, University of Florida

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

2016 – **Professor (Courtesy)**, Department of Neurology, University of Florida

2014 **Visiting Professor**, Department of Clinical Neurosciences, Division of Neurosurgery, Spectrum Health System, Grand Rapids, MI

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

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

1998 – 2002 **Research Assistant**, Electrical Engineering & Computer Science Dept., Univ. of Michigan, Ann Arbor

HONORS & AWARDS

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

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

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

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 Best Undergraduate Student award (~74,000 students), University of Alexandria, Egypt

---

Research Experience

GRANTS AWARDED

A) Active:

1. "*Optimized Learning via Peripheral Nerve Stimulation*" 01/01/17 - 12/31/20

Agency: **DARPA** Role: PI Amount: **$ 4,200,000**

2. "*Optimizing microstimulation to restore lost somatosensation*" (R01) 07/01/2015 - 06/30/20
   Agency: **NIH-NINDS** Amount: **$ 1,758,257**
   Role: PI

3. *Neuromodulation-based treatment of diabetes: identifying anatomical and physiological pancreatic innervation targets*" (OT2) 09/28/20-07/31/18

   Agency: **NIH** Role (Co-PI (Campbell-Thompson, PI)) Amount: **$591,960**

B) Completed

4. "Collaborative Research: IUSE: EHR - Enhancing and Expanding Experiential Learning Modules across Disciplines and Institutions" 09/01/2015-08/31/2017
   Agency: **NSF** Amount: **$158,983**
   Role: Co-PI (Kim (NWU) , PI)

5. " A Clinically Viable Brain Machine Interface" 12/12/11 - 08/31/14
   Agency: **DARPA** Amount: **$2,678,683**
   Role: PI
6. "A primate model of an intra-cortically controlled FES prosthesis for grasp" 07/1/11-6/30/16
   Agency: **NIH-NINDS** Amount:**$50,000**
   Role: Co-Investigator (Miller, PI)
7. "High Speed Brain Machine Interface" 08/16/13 - 11/30/14
   Agency: **Michigan Initiative for Innovation and Entrepreneurship** Amount: **$ 36,000**
   Role: Sole PI
8. " A Clinically Viable Brain Machine Interface in a Primate Model of Amputation" 12/02/13 -11/30/15
   Agency: **Michigan State University** Amount: **$50,000**
   Role: Sole PI
9. "A Wireless, Multiscale, Distributed Interface to the Cortex" (R01) 08/15/08 - 07/31/14
   Agency: **NIH-NINDS** Amount: **$ 2,210,452**
   Role: Sole PI
10. "High Speed Brain Machine Interface" 08/16/12 - 08/15/13
    Agency: **Michigan Initiative for Innovation and Entrepreneurship** Amount: **$41,500**
    Role: PI
11. "Mining Large-Scale Neural Ensemble Recordings" (R33) 01/01/09 - 12/31/12
    Agency: **NIH-NINDS** Amount: **$954,100**
    Role: Sole PI
12. "Advanced Microsystems for Neural Information Processing" (R21) 03/01/06 -- 02/28/09

Agency: **NIH-NINDS:** Neuroprosthesis program Amount: **$355,852**
Role: PI

13. "Mining Large-Scale Neural Ensemble Recordings" (R21) 01/15/07 - 12/31/08
Agency: **NIH-NINDS** Amount: **$249,407**
Role: PI

14. "Quantitative Biology Modeling Initiative: Cortical Processing of Motor Sequences" 12/01/04 - 08/30/05
Agency: **Michigan State University** Amount: **$11,000**
Role: Co-Investigator (PI: Sakai)

PATENTS

1. **K. Oweiss,** M. Aghagolzadeh, "Multiscale Intra-Cortical Neural Interface System" US Patent 20,110,307,079

INVITED LECTURES & DISTINGHUISHED SEMINARS (excluding paper presentations)

1. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Cognitive Neural Interfaces", **Imperial College, London, UK** August 9th 2017
2. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Clinically Viable Bi-directional Neural Interfaces" **Oxford University, Oxford**, UK, August 8th 2017.
3. "Targeted Neuroplasticity: Natural and Artificial Shaping of Neural Correlations for Clinically Viable Bi-directional Neural Interfaces", **University of Sheffield, UK**, August 7th, 2017
4. "Reverse Neural Engineering: *Implications for Clinically Viable Brain Machine Interfaces"* IEEE Workshop on **Advanced NeuroTechnologies for BRAIN Initiative**, San Diego, November 8th, 2016
5. "Optimized Learning via Peripheral Nerve Stimulation" Targeted Neuroplasticity Program, **DARPA PI meeting**, San Diego, November, 9th 2016
6. "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
7. "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
8. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" **McKnight Brain Institute***,* University of Florida, FL, 10/29/2015
9. "Reverse Engineering the Brain: Implications for Clinically Viable Brain Machine Interfaces" **Department of Biomedical Engineering***,* University of Florida, FL, 10/27/2014
10. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Department of Neurosurgery, Spectrum Health System**, Grand Rapids, MI, 05/21/2014
11. "Clinically Viable Brain Computer Interfaces", *Center for Neural Engineering*, Biomedical Engineering Department, **Columbia University,** 05/05/2014
12. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Cleveland Clinic**, scheduled on 02/27/2014
13. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neurology Grand Rounds*, **Department of Neurology & Sparrow Health System**, MSU, East Lansing, MI, 01/15/2014
14. "Conversing with the Brain", **Department of Electrical and Computer Engineering**, University of Florida, FL, 01/04/2014
15. "Clinically Viable, Bi-directional Brain Machine Interfaces," *Neuroscience Program*, **Michigan State University**, East Lansing, MI, 10/10/2013
16. "Clinically Viable Brain Machine Interfaces," **MSU Board of Trustees**, East Lansing, MI, 06/21/2013
17. "Dynamics of thalamocortical circuits underlying sensorimotor integration", **Workshop on System Identification in Computational Neuroscience, Paris, France,** 07/17/2013
18. "Conversing with the Sensorimotor Brain", **Yale University, Department of Neurobiology**, New Heaven, USA, 05/10/2013

19. "Challenges in decoding and sensory feedback for limb prosthetic control", 4th International Conference on Neuroprosthetic Devices (ICNPD), **University of Freiburg, Germany**, 11/21/2012
20. "A Clinically Viable Brain Machine Interface" **DARPA PI meeting**, New Orleans, USA, 11/13/2012
21. "Conversing with the Brain", **Max Planck Institute, Tübingen, Germany**, 07/13/2012
22. "A Clinically Viable Brain Machine Interface", **Institute of Microsystems, Albert-Ludwig University of Freiburg, Germany**, 07/11/2012
23. "A Clinically Viable Brain Machine Interface", **Ernst Strüngmann Institute for Brain research, Max Planck Society, Frankfurt, Germany**, 07/10/2012
24. "Optogenetics, Neural Ensemble Recording and Graphical Models: Characterizing Neuroplasticity *in vivo*" **Biomedical Engineering Dept., Boston University,** USA, 04/18/2012
25. "Conversing with the Brain", Media Lab & Biological Engineering Seminar series, **Massachusetts Institute of Technology, USA,** 04/19/2012
26. "Conversing with the Brain" Biomedical Engineering Dept. Seminar Series, **University of New South Wales, Sydney, Australia,** 11/25/2011
27. "Bi-Directional Neural Interfaces for Optimizing Stimulation" **3rd International Conference on Neuroprosthetic Devices (ICNPD), Sydney, Australia**, 11/27/2011
28. "Conversing with the Brain" Electrical Engineering Seminar Series, **University of Southern California, Los Angeles**, 10/04/2011
29. "Reading from and Writing to Cortical Networks" Biomedical Engineering Dept. Seminar Series, **University of Miami, Florida**, USA, 08/02/2011
30. "Graphical Models of Functional and Effective Neural Connectivity", **Joint Statistical Meeting, Miami Beach, Florida**, USA, 08/01/2011
31. "Sparsity in the Brain", **Ecole Polytechnic Federal de Lausanne (EPFL), Swiss Federal Institute of Technology, Lausanne, Switzerland,** 07/21/2011
32. "The Facebook of the Mind: Reading from and Writing to Brain Networks" **Department of Biomedical Engineering, University of Florida**, Gainesville, 03/17/2011
33. "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
34. "Neural Encoding, Decoding and Control: The Quest for Bi-directional Brain Machine/Computer Interfaces", **Institute of Neuroscience, University of Newcastle, UK,** 09/09/2010
35. "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
36. "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
37. "Synergistic Neural Coding: Implications for Neuroprosthetic Devices and Brain Machine Interfaces", 2nd **International Conference on Neuroprosthetic Devices (ICNPD), Beijing, China**, 02/28/2010
38. "10 years of Brain Machine Interfaces: What's next?" **Department of Neurology, University of Georgia,** USA, 02/23/2010
39. "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
40. Department of Physics and Astronomy, Center for Nanomaterials Design and Assembly, Michigan State University, USA, 10/23/2008
41. "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
42. "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

43. "Engineering Large Scale Interfaces to the Nervous System: Can We Electronically Read the Mind?" **Mathematical Biosciences Institute, Ohio State University, USA,** 05/06/2008
44. "How Can We Decode the Micro Scenes of an Unknown Neural Code?" Electrical & Computer Engineering Department, **Georgia Institute of Technology, USA**, 04/21/2007
45. "Mining Large Scale Neural Recordings" Dept. of Computer Science and Engineering, **Oakland University, USA**, 06/10/2007
46. "Neural Engineering: Developing Technology for Reliable Brain Machine Interface Systems," Bio-Diagnostics Research Lab, **Michigan State University, USA,** 03/27/2007
47. "Sensing Neural Ensemble Activity in Resource-Constrained Brain Machine Interfaces" Neuroengineering Lab, Institute for Signal Processing, **University of Lübeck, Germany,** 07/21/2006
48. "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
49. "Towards Understanding the Micro-Environment of the Brain: Biologically Inspired Neuroprosthetics: Principles & Frontiers" Neuroscience Program Seminar Series, **Michigan State University,** 04/04/2004
50. "Brain Machine Interfaces" College of Engineering seminar series, **Michigan State University,** 12/05/2002

MENTORSHIP ACTIVITY

Current Assistant Research Scientists and Postdoctoral fellows

Narayan Subramanian, PhD, (2017 – present) "Targeted Plasticity Training via Peripheral Nerve Stimulation"

Zejun Wang, PhD (2018 – present) **"** Neural Correlates of perceptual learning in prefrontal cortex"

Deo Singh, PhD (2017 -present) "Mapping of Pancreatic Islets Innervation using Two photon Fluorescent imaging"

Past Mentored Postdoctoral fellows

Shiying Hao, **PhD** (Electrical and Computer Engineering, Univ. of Bath, UK): "Wireless Implantable Microsystems for Neural Interfaces" (2012 - 2014), now a Research Scientist at Stanford School of Medicine

Jianbo Liu, PhD (Mechanical Engineering, University of Michigan, USA): "Feedback Control for Optimizing Microstimulation in Bi-directional Brain Machine Interfaces" (2009-2011), now a Research Scientist at BHSAI, Henry Jackson Foundation.

Fei Zhang, PhD (Physics, Wuhan University, PRC): "A Wireless neural Interface System for freely behaving subjects" (2009-2011), now a Postdoctoral Associate at Virginia Tech

Supervised PhD Dissertations

1. **Hong Jae Kim,** ECE: " A mobile cage platform for studying BMI learning with two photon optogenetics"
2. **Joseph Canzano,** Medical Sc.: "Cholinergic influence in Prefrontal Cortex under Vagus Nerve Stimulation"
3. **May Mansy,** BME: "Neural Dynamics of flexible goal directed behavior"
4. **Seyed Mehrdad Hashemi**, ECE: "Hardware embedding of Lifting-based wavelet transform computation for real time neural interfacing with neural ensembles"
5. **Phillip Navarro,** ECE: "Sensory guided motor control under natural and artificial thalamic feedback"
6. **Benjamin Goolsby**, BME: "Circuit mechanisms of Working Memory in Prefrontal Cortex"

Past Students

7. **Ali Mohebi,** Ph.D., ECE, Aug 2014: "Neural ensemble correlates of cognitive control in the rat medial prefrontal cortex", now Postdoctoral Fellow, Department of Psychology, University of Michigan, Ann Arbor
8. **Mehdi Aghagolzadeh**, Ph.D., ECE, Dec 2012: "Statistical Signal Processing Tools for Analyzing Large-Scale Neural Ensembles", now Postdoctoral Fellow, Department of Neuroscience, Brown University

9. **Seif Eldawlatly**, Ph.D., ECE, May 2011: "Graph-based techniques to infer Functional and Effective Neuronal Connectivity from Spike Train Ensembles", now Assistant Professor, Ain-Shams Univ. Cairo, Egypt
10. **Akhil Perincherry,** M.S., ECE Summer and Fall 2016, "real time tracking of active whisking during tactile-based decision making", now at Ford Motor Company: autonomous driving R&D division
11. **Joseph Succar,** M.S., ECE, Summer 2015- fall 2016: "real time tracking of active whisking during detection and discrimination tasks"
12. **Ahmed Eleryan**, M.S., ECE, August 2013: "Stability and tracking of unit activity in cortically controlled Brain Machine Interfaces", now Research Associate at Google, Inc
13. **Ki Yong Kwon**, M.S.: May 2010: "NeuroQuest: A comprehensive software package for the analysis of large scale neural ensemble recordings", now Application Engineer, Plexon Inc, Dallas, TX
14. **Esraa El-Sharoa**, M.S.: Aug 2007: "Augmenting information channels in cochlear Implants under adverse conditions"
15. **Kyle Thomson**, M.S.: Dec 2006: "Hardware considerations for implantable neural interface system design"
16. **Yasir Suhail**, M.S., August 2005: "Methods for processing and analysis of multichannel neural recordings"

Supervised Graduate and Undergraduate Interns

17. **Brandey Andersen,** BME: "A 4-alternative, forced choice, memory guided task for studying cognitive control of action selection"
18. **Islam Badreldin,** MS, ECE: "Kernel methods for unsupervised neural decoding in Brain Machine Interfaces"
19. **Elliot Spector,** BS, Neuroscience, 2015
20. **Orlando Murray**, UG, BE, ECE university of Florida, 2016
21. **Mark McNeeley**, UG, ECE, university of Florida, Spring, Summer and Fall 2016
22. **Megan Parsons,** A.B. Neurobiology Honors UG candidate, Harvard University, Summer 2015
23. **Lee Elisevich,** UG Biomedical Engineering, University of Michigan, Summer 2014
24. **Dylan Miller**, UG neuroscience major, Fall 2013 – Spring 2014
25. **Matthew Barringer**, UG Biomedical Engineering major, Fall 2013– Spring 2014
26. **Samuel Akwei-Sekyere**, UG Neuroscience major, Fall 2012 – Spring 2014
27. **Hannah Batchelor**, UG Neuroscience major, Fall 2012
28. **Marissa Zoratti**, MSU UG, Neuroscience major, Fall 2012 – Fall 2014
29. **Caitlin Slicker**, MSU UG, Electrical Engineering major, Spring 2013

Teaching and Service

Editorial Activities for Scholarly Journals

Editor and Co-author, *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

Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

Member, Society for Neuroscience

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

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 – *present*

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 – present

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

Grant and Scholarly Journal Reviewing Activities

1. ***Ad Hoc study section member for the BRAIN initiative, U01, U19, UH1***
2. ***Standing Member*** of the **Department of Veterans Affairs** RR&D Scientific Merit Review Board (10/01/2015 – present)
3. ***Standing Member*** of **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. ***Review Panelist*** of the following **NIH study sections**: NIH Big-Data-To-Knowledge (BD2K) Initiative, NINDS Institutional Center Core Grants to Support Neuroscience Research (P30), High Impact Neuroscience Research Resource Grants (R24), NIH Director's Independence Award program, Clinical Neurophysiology, Devices and Neuroprosthetics/Brain Disorders, NIH Ruth Kerstein Service Award (F30, F31, F32), 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)
6. ***Review Panelist*** for the **Department of Defense** (DoD) Congressionally Directed Medical Research Program (CDMRP) (2010 – present)
7. ***Review Panelist*** *for* Dept. of Veterans Affairs Rehabilitation Research and Development Service Spinal Cord Injury and Neuropathic Pain panel (2015)
8. ***Review Panelist*** for the European Career Development Award Program, Human Frontier Science Program Organization (HFSPO), Strasbourg, France (2013)
9. ***Review Panelist*** for: The National Science Foundation: Biomedical Engineering Panel, The American Institute of Biological Sciences, The Maryland Technology Development Corporation (TEDCO), The Oak Ridge Associate Universities (ORAU), The Dutch Technology Foundation for academic research in applied sciences, 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

Paper Referee for the following Journals: Nature, Neuron, Proceedings of the National Academy of Science, 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 Transactions on Neural Systems and Rehabilitation Engineering, IEEE Transactions on Signal Processing, IEEE Transactions on Biomedical Circuits & Systems, IEEE Transactions on Systems, Man and Cybernetics, IEEE Signal Processing Letters, IEEE Signal Processing Magazine, IEEE Transactions 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"

INSTRUCTION ACTIVITIES

** New courses offered*
*** Core courses co-taught with Neuroscience Program Faculty*

Undergraduate Level

1) *Bioelectrical Systems** — Fall'15,'16,'17, '18
2) *Modeling and Analysis of Bioelectrical Systems* — Fall'13
3) *Linear Circuits* (Sophomore) — Spring'03
4) *Electrical Circuits & Systems II* (Sophomore) — Spring'09, Fall'09
5) *Circuits and Systems* (Junior) — Spring'04
6) *Introduction to Signal Processing* (Sophomore) — Fall'04, Spring'07, Fall'07
7) *Senior Capstone Design* — Fall'06, '07, '08,'12

Graduate Level

1) *Neural Signals, Systems and Technology** — Spring'15, '16, '17, '18
2) *Neural Engineering and Brain Machine Interfaces** — Spring of '08,'12,'13, Fall'10,'12
3) *Systems Neuroscience* — Spring of '08, '09, '10, '12, '13
4) *Linear Control Systems* — Fall'02
5) *Detection and Estimation Theory* — Spring of '04,'05,'06
6) *Advanced Signal and Array Processing* — Fall'05

* Teaching Evaluations:

Spring 2017: Overall rating of the instructor: 4.57 (ECE Dept mean 4.46, CoE mean 4.43)
Fall 2017: Overall rating of the instructor: 4.55 (ECE Dept mean 4.26, CoE mean 4.18)

INSTITUTIONAL SERVICE

2016 –	Faculty Search Committee, College of Engineering, University of Florida
2016 –	Undergraduate Studies Committee, College of Engineering, University of Florida
2015 –	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

1. 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** (2017), "Emergent Coordination Underlying Learning to Reach-to-Grasp with a Brain-Machine Interface", *Journal of Neurophysiology*
2. K Balasubramanian, M Vaidya, J Southerland, I Badreldin, A Eleryan, M. Slutzky, A. Fagg N. Hatsopoulos, **K G Oweiss** (2017) 'Changes in cortical network connectivity with long-term brain-machine interface exposure after chronic amputation', *Nature communications* 8 (1), 1796
3. 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
4. A Laine, …, **K. Oweiss,** et al. "IEEE Workshop on Advanced NeuroTechnologies for BRAIN Initiatives", IEEE Pulse, Volume: 7, Issue: 5, Sept.-Oct. 2016
5. **K. Oweiss**, and I. Badreldin (2015) "Neuroplasticity subserving the operation of brain–machine interfaces." *Journal of Neurobiology of disease* 83: 161-171.
6. 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
7. 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
8. **K. Oweiss** (Section Editor) (2014) "Brain Machine Interface: Overview" in *Springer Encyclopedia of Computational Neuroscience* (Dieter Jaeger & Ranu Jung, Eds), Springer Verlag
9. I. Badreldin, **K. Oweiss** (2014) "Neural Decoding" in *Springer Encyclopedia of Computational Neuroscience* (Dieter Jaeger & Ranu Jung, Eds), Springer Verlag
10. 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
11. A. Mohebi, **K. Oweiss**, (2013) "A fully automated rodent conditioning protocol for sensorimotor integration and cognitive control experiments," *Journal of Visualized Experiments*
12. 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. of Neural Engineering*, 9, 065004, doi:10.1088/1741-2560/9/6/065004

13. F. Zhang, M. Aghagolzadeh, and **K. Oweiss**, (2012) "A Fully Implantable, Programmable and Multimodal Neuroprocessor for Wireless, Cortically Controlled Brain-Machine Interface Applications," *Journal of Signal Processing Systems*, pp. 1-11, doi:10.1007/s11265-012-0670
14. K.Y. Kwon, S. Eldawlatly, **K. Oweiss** (2012)"NeuroQuest: A Comprehensive Analysis Tool for Extracellular Neural Ensemble Recordings," *Journal of Neuroscience Methods 204, 189– 201*
15. 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
16. 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
17. 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," *Journal of Neural Engineering*, 8: 045002
18. M. Grosse-Wentrup, D. Mattia, **K. Oweiss** (2011), "Using Brain-Computer Interfaces to Induce Neural Plasticity and Restore Function," *Journal of Neural Engineering,* 8: 025004
19. **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
20. **K. Oweiss,** (Invited) (2011) "Brain Machine Interfaces for personalized neurological diagnostics and therapy" *Journal of CyberTherapy and Rehabilitation,* 4:1, pp. 38 (ISSN: 1784-9934)
21. M. Aghagolzadeh, S. Eldawlatly and **K. Oweiss**, (2010) "Synergistic Coding by Cortical Neural Ensembles" *IEEE Transactions on Information Theory*, 56:2, pp. 875-899
22. 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", *Journal of Neural Computation*, MIT Press, 22:1, pp. 158-189
23. **K. Oweiss,** Editor (2010), *Statistical Signal Processing for Neuroscience and Neurotechnology*, Academic Press, Elsevier, 1st edition, ISBN-13: 978-0-12-375027-3.
24. **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
25. 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
26. **K. Oweiss,** (2010) *Statistical Signal Processing for Neuroscience and Neurotechnology*, Academic Press, Elsevier, 1st edition, pp. 1-11, ISBN: 978-0-12-375027-3
27. T. W. Berger, Z. Chen, A. Cichocki, **K. Oweiss**, R. Quian Quiroga, and N. V. Thakor, (2010) "Signal Processing for Neural Spike Trains," *Journal of Computational Intelligence and Neuroscience,* Volume 2010, Article ID 698751, 2 pages, doi:10.1155/2010/698751
28. **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
29. 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
30. S. Eldawlatly, R. Jin, and **K. Oweiss**, (2009) "Identifying Functional Connectivity in Large Scale Neural Ensemble Recordings: A Multiscale Data Mining Approach", *Journal of Neural Computation*, MIT Press, 21:2, pp. 450-477
31. M. Kamboh, A. Mason and **K. Oweiss**, (2008) "Analysis of Lifting and B-Spline DWT Implementations for Implantable Neuroprosthetics," *Journal of Signal Processing Systems,* 52:3, pp. 249-261

32. 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

33. **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

34. **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

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

36. **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
37. **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

38. **K. Oweiss**, D.J. Anderson, (2002) "Spike Sorting: A Novel Shift and Amplitude Invariant Technique," *Journal of Neurocomputing*, Vol 44-46, pp. 1133-1139
39. **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

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

Refereed Conference Papers
(i) Full publication review

41. I. Badreldin, **K. Oweiss**, (2014), "A Design and Implementation Framework for Unsupervised High-resolution Recursive Filters in Neuromotor Prosthesis Applications," *Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA
42. 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
43. 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
44. 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
45. J. Daly, E. Purcell, M. Zoratti, **K. Oweiss**, (2013) "Control of Somatosensory Cortex via Optogenetic Stimulation of Motor and Thalamic Pathways", in *Proc. IEEE Int. Conf. on EMBC*
46. 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 *Proc. IEEE Int. Conf. on EMBC*
47. 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
48. 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

49. 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
50. 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
51. 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
52. 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
53. 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
54. 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
55. 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
56. 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
57. 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
58. 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
59. 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
60. 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
61. 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
62. 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
63. 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
64. 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
65. 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
66. F. Abu-Nimeh, M. Aghagolzadeh, **K. Oweiss**, (2008) "VLSI-friendly architecture for real-time spike sorting in Brain Machine Interface applications," in *Proc. IEEE Biomedical Circuits & Systems (BioCAS),* pp. 265-268
67. M. Aghagolzadeh, M. Shetliffe, **K. Oweiss**, (2008) "Impact of Compressed Sensing of Motor Cortical Activity on Spike Train Decoding in Brain Machine Interfaces," in *Proc. 30th IEEE Eng. in Medicine and Biology (EMBC),* pp. 5302-5305
68. S. El-Dawlatly, Y. Zhou, R. Jin and **K. Oweiss**, (2008) "Reconstructing Functional Neuronal Circuits using Dynamic Bayesian Networks" *Proc. 30th IEEE Eng. in Medicine and Biology (EMBC),* pp. 5531-5534

69. **K. Oweiss**, M. Shetliffe and S. Eldawaltaly (2008) "Revamping Signal Processing for Adaptive, Real Time, Bi-directional Brain Machine Interface Systems," *IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), 5197-5200
70. A. M. Kamboh, M. Raetz, A. Mason and **K. Oweiss**, (2007) "Area-Power Efficient Lifting-Based DWT Hardware for Implantable Neuroprosthetics," *Proc. of IEEE Int. Symposium of Circuits and Systems* (ISCAS), pp. 2371-2374
71. S. El Dawlatly and **K. Oweiss**, (2007) "Tracking Plasticity in Probabilistic Spike Trains Models of Synaptically-Coupled Neural Population," in *Proc. of 3rd Int. IEEE EMBS Conf. on Neural Engineering*, pp. 498-501
72. M. A. Shetliffe, K. Lorenz, B. Pietrzyk, and **K. Oweiss**, (2007) "Compressed and Distributed Sensing of Population Activity for Multiscale Decoding of Motor Cortical Response Properties," in *Proc. of 3rd IEEE EMBS Conf. on Neural Engineering*, pp. 217-220
73. F. Chen, S. El-Dawlatly, R. Jin and **K. Oweiss**, (2007) "Identifying and Tracking the number of independent clusters of functionally interdependent neurons from biophysical models of population activity," in *Proc. of 3rd IEEE EMBS Conf. on Neural Engineering*, pp. 542-545
74. A. M. Kamboh, A. Mason and **K. Oweiss**, (2007) "A High-Yield Area-Power Efficient DWT Hardware for Implantable Neural Interface Applications," in *Proc. of 3rd IEEE EMBS Conf. on Neural Engineering*, pp. 212-216
75. **K. Oweiss**, (2007) "Compressed and Distributed Sensing of Multivariate Neural Point Processes," in *Proc. IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), Vol. II pp. 577-580
76. A. Kamboh, A. Mason, **K. Oweiss**, (2006) "Comparison of Lifting and B-Spline DWT Implementations for Implantable Neuroprosthetics," in *IEEE Sensors*, Daegu, Korea, pp 22-25
77. S. Chakrabartty, A. Gore and **K. Oweiss**, (2006) "An adaptive multiple-input multiple-output analog-to-digital converter for high density neuroprosthetic electrode arrays" *in Proc. 28th IEEE Eng. in Medicine and Biology (EMBC)*, pp. 656-659
78. **K. Oweiss**, R. Jin, F. Chen, (2006) "Assessing temporal and spatial evolution of clusters of functionally interdependent neurons using graph partitioning techniques," in *Proc. 28th IEEE Eng. in Medicine and Biology (EMBC)*, pp.1601-1604
79. **K. Oweiss**, (2006) "A MIMO channel approach for characterizing electrode-tissue interface in long-term chronic microelectrode array recordings" *in Proc. 28th IEEE Eng. in Medicine and Biology (EMBC)*, pp.3357-3360
80. K. Thomson and **K. Oweiss**, (2006) "Hardware Considerations of a Spatial Filter for Decorrelating High-density Multielectrode Neural Recordings" in *Proc. 28th IEEE Eng. in Medicine and Biology (EMBC)*, pp. 1244-1247
81. Y. Suhail, **K. Oweiss**, (2006) "Augmenting Information channels in Hearing Aids and cochlear implants under adverse conditions", *in Proc. of IEEE Conf. Acoustics, Speech & Signal Processing (ICASSP)*, vol. V, pp. 889-893
82. R. Jin, Y. Suhail, **K. Oweiss**, (2006) "A Mixture model for spike train ensemble analysis using spectral clustering," *in Proc. IEEE Conf. Acoustics, Speech & Signal Processing (ICASSP)*, vol. V, pp. 885-888
83. **K. Oweiss**, D. Anderson, (2006) " Exploiting signal subspace invariance to resolve non-stationary, non-orthogonal sensor array signals in correlated noise fields," *in Proc. IEEE Conf. Acoustics, Speech & Signal Processing (ICASSP)*, vol. IV, pp.885-888
84. **K. Oweiss**, (2005) "Latency Reduction During Telemetry Transmission in Brain-Machine Interfaces" in *Proc. 27th IEEE Eng. in Medicine and Biology (EMBC)*, pp. 2075-2078
85. Y. Suhail, **K. Oweiss**, (2005) "Multiresolution Bayesian Detection of Multiunit Extracellular Spike Waveforms in Multichannel Neuronal Recordings," *in Proc. 27th IEEE Eng. in Medicine and Biology (EMBC),* pp.141-144
86. **K. Oweiss**, A. Mason, K. Thomson, J. Li, Y. Suhail, (2005) "Augmenting Real-Time DSP in Implantable High-Density Neuroprosthetic Devices," in *Proc. 3rd IEEE- Conf. on Microtechnology in Medicine & Biology*, pp.108-111

87. A. Mason, J. Li, K. Thomson, Y. Suhail, **K. Oweiss**, (2005) "Design Optimization of Integer Lifting DWT Circuitry for Implantable Neuroprosthetics," in *Proc. 3rd IEEE- Conf. on Microtechnology in Medicine & Biology*, pp. 112-115

88. K.E. Thomson, Y. Suhail, and **K. Oweiss**, (2005) " A scalable architecture for streaming neural information from implantable multichannel neuroprosthetic devices," in *Proc. of IEEE Int. Symp. on Circuits & Systems (ISCAS)*, pp. 1342-1345

89. **K. Oweiss**, R. Jin, Y. Suhail, (2005) "Scale-Space Processing and Clustering for Efficient Multi-Electrode Data Analysis of Large-size Neuronal Ensembles," in *Proc. 2nd Int. IEEE Conf. on Neural Engineering,* pp.217-220

90. **K. Oweiss**, K. Thomson, D. Anderson, (2005) "A Systems Approach for Real-Time Data Compression in Advanced Brain-Machine Interfaces," in *Proc. 2nd IEEE Conf. on Neural Engineering*, pp.62-65

91. Y. Suhail, and **K. Oweiss**, (2004) "A Reduced Complexity Integer Lifting Wavelet-Based Module for Real-Time Processing in Implantable Neural Interface Devices," in *Proc. 26th IEEE Eng. in Medicine and Biology (EMBC)*, pp. 4552-4555

92. **K. Oweiss**, (2004) "An Information Theoretic Approach for Optimizing The Analysis Of High-Density Multi-electrode Multi-unit Neuronal Recordings," in *Proc. 26th IEEE Eng. in Medicine and Biology (EMBC)*, pp. 4520-4523

93. **K. Oweiss**, (2004) "Data Fusion in Wireless Sensor Array Networks with Signal and Noise Correlation Mismatch,"in *Proc. of IEEE Conf. Acoustics, Speech & Signal Processing (ICASSP)*, II, 281-284

94. D.J. Anderson, **K. Oweiss**, (2003) "Capturing Signal Activity and Spatial Distribution of Neurons in a Sub-Millimeter Volume," *Proc. of 36th IEEE Asilomar Conf. on Signals, Systems and Computers*, 387-391

95. **K. Oweiss**, D.J. Anderson, and Marios M. Papaefthymiou (2003) "Optimizing Signal Coding in Neural Interface System-on-a-Chip Modules," in *Proc. of 25th IEEE Int. Conf. on Eng. in Medicine and Biology (EMBC)*, (I): 2016-2019

96. **K. Oweiss**, (2003) "Source Detection in Correlated Multichannel Signal and Noise Fields," in *Proc. of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), vol. V: 257-260

97. **K. Oweiss**, (2003) "Spike Superposition Resolution In Multichannel Extracellular Neural Recordings: A Novel Approach," in *Proc. of 1st Int. IEEE Conf. on Neural Engineering*, (I): 130-133

98. **K. Oweiss**, D.J. Anderson, (2002) "Independent Component Analysis of Multichannel Neural Recordings at the Micro-Scale,"in *Proc. of the 2nd joint IEEE BMES-EMBC,* (I): 2012-2013

99. **K. Oweiss**, D.J. Anderson, (2002) "A Unified Framework for Advancing Array Signal Processing Technology of Multichannel Microprobe Neural Recording Devices," in *Proc of 2nd IEEE-EMBS Conference on Microtech. in Med. & Bio.,* (I):245-250

100. **K. Oweiss**, D.J. Anderson, (2002) "A Multiresolution Generalized Maximum Likelihood Approach for the Detection of Unknown Transient Multichannel Signals in Colored Noise with Unknown Covariance," in *Proc. of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP), vol. (3): 2993-2996

101. **K. Oweiss**, D.J. Anderson, (2001) "MASSIT- Multiresolution Analysis of Signal Subspace Invariance Techniques: A novel technique for blind source separation," in *Proc. of IEEE 35th Asilomar Conf. on Signals, Systems and Computers*, (I):819-823

102. **K. Oweiss**, D.J. Anderson, (2001) "Neural Source Localization using Advanced Sensor Array Signal Processing Techniques," in *Proc. of the 23rd IEEE Eng. in Medicine and Biology (EMBC),* (I): 707-710

103. **K. Oweiss**, D.J. Anderson, (2001) "A New Technique for Blind Source Separation using Subband Subspace Analysis in Correlated Multichannel Signal Environments," in *Proc. of IEEE Int. Conf. Acoustics, Speech & Signal Processing* (ICASSP)*, vol.* I: 2813-2816

104. D.J. Anderson, **K. Oweiss**, and S. M. Bierer, (2001) "Sensor Arrays in the Micro-Environment of the Brain," in *Proc. of IEEE Int. Conf. Acoustics, Speech & Signal Processing (ICASSP),* (I): 3433-3436

105. **K. Oweiss**, D. J. Anderson, (2000)"A New Approach to Array Denoising," in *Proc. IEEE 34th Asilomar Conference on Signals, Systems and Computers*, (I): 1403-1407

106. **K. Oweiss**, M.K. Wise, C. Lopez, J. Wiler, and D.J. Anderson, (1999) "Chronic Electrode-Brain Interface Modeled with FEM," in *Proc. of the 1st Joint IEEE-EMBC & BMES*, (I):453
107. **K. Oweiss**, O. A. Alim, (1996) "Performance evaluation of time-delay fuzzy neural networks for isolated word recognition," in *IEEE Int. Symp. on Neuro-Fuzzy Systems*, pp: 203 - 211
108. **K. Oweiss**, O.A. Alim, and N.E. Boghdadly, (1996) "Isolated word recognition using time-delay fuzzy neural networks," in *SPIE 10th Int. conf. Aerospace/Defense sensing and control*, Vol. 2761, No.2, pp.1511-1515
109. M. Aghagolzadeh and **K. Oweiss**, (2011) "Prediction of Spatiotemporal Patterns of Neural Activity Using a Higher-Order Markov Representation of Instantaneous Pairwise Maximum Entropy Model," *BMC Neuroscience,* 12(Suppl 1):P245, doi:10.1186/1471-2202-12-S1-P245
110. S. Eldawlatly, **K. Oweiss,** (2011), "Network dynamics associated with experience-dependent plasticity in the rat somatosensory cortex," *BMC Neuroscience,* 12(Suppl 1):P246, doi:10.1186/1471-2202-12-S1-P246
111. A. Mohebi, J. Cardin, **K. Oweiss**, (2011) "A cell-type-specific dynamic Bayesian network model for spontaneous and optogenetically evoked activity in the primary visual cortex," *BMC Neuroscience,* 12(Suppl 1):O5, doi:10.1186/1471-2202-12-S1-O5
112. S. Eldawlatly, **K. Oweiss,** (2010), "Causal networks in the rat barrel cortex provide a signature of stimulus encoding," *BMC Neuroscience*, 11 (Suppl 1):O18, doi:10.1186/1471-2202-11-S1-O18
113. J. Liu, **K. Oweiss** and H. Khalil , (2010) "Feedback control of the spatiotemporal firing pattern of a basal ganglia microcircuit model," *BMC Neuroscience*, 11 (Suppl 1):O16, doi:10.1186/1471-2202-11-S1-O16
114. S. Eldawlatly, M. Aghagolzadeh, **K. Oweiss,** (2009) "Decoding spike train ensembles using the cooperative interaction between task-dependent cortical neurons" *BMC Neuroscience*, 10 (Suppl 1):P96 doi: doi:10.1186/1471-2202-10-S1-P96
115. S. Eldawlatly, Y. Zhou, R. Jin, **K. Oweiss**, (2008) "Inferring neuronal functional connectivity using dynamic Bayesian networks" *BMC Neuroscience*, 9 (Suppl 1):P19 doi:10.1186/1471-2202-9-S1-P19
116. M. Aghagolzadeh, **K. Oweiss**, (2008) "Investigating the Effect of Cortical Discharge Variability on the Accuracy of Population Decoders," *BMC Neuroscience*, 9 (Suppl 1):P2, doi:10.1186/1471-2202-9-S1-P2
117. S. Eldawlatly, **K. Oweiss**, (2007) "Identifying spike-timing dependent plasticity in spike train models of synaptically-coupled neuronal ensembles," *BMC Neuroscience*, 8(Suppl 2): P193, doi:10.1186/1471-2202-8-S2-P193

(iii) Abstracts & Abstract-reviewed papers

118. M. Mansy, M. Abdellah, F. Schürmann, H. Kim and **K. Oweiss** (2017) "Characterization of detection iso-contours in a single fiber photometry system" *Society for Neuroscience Abstracts*, Washington DC, 2017
119. M. Mansy, I. Badreldin and **K. Oweiss** (2016) "Characterizing tactile coding in the whisker-barrel system using calcium epifluorescence imaging in rats" *Society for Neuroscience Abstracts*, San Diego, 2016
120. A. Mohebi, M. Mansy, E. Purcell, D. Miller, **K. Oweiss** (2015) "Medial prefrontal cortex is differentially engaged in multiple aspects of sensorimotor integration in a delayed choice task" *Society for Neuroscience Abstracts*, Chicago, 2015
121. I. Badreldin, M. Vaidya, K. Balasubramanian, J. Southerland, A. Eleryan, A. Fagg, N. Hatsopoulos, **K. Oweiss**, (2015) "Single-unit dynamics match decoder filter dynamics during closed-loop brain-machine interface operation," *Society for Neuroscience Abstracts*, Chicago, 2015
122. M. Vaidya, K. Balasubramanian, J. Southerland, A. Eleryan, I. Badreldin, A. Fagg, **K. Oweiss**, N. Hatsopoulos (2015) "Neural dynamics underlying emergent coordinated reach-to-grasp in a long-term BMI study", in *Society for Neuroscience Abstracts,*, Chicago, 2015
123. M. Vaidya, K. Balasubramanian, J. Southerland, A. Eleryan, I. Badreldin, A. Fagg, **K. Oweiss**, N. Hatsopoulos (2014) "Emergence of coordinated reach-to-grasp behavior in a long-term BMI experiment," in Society for Neuroscience, Washington DC, 2014.
124. E. K. Purcell, J. Daly, M. Mansy, A. Mohebi, M. Zoratti, **K. Oweiss**, (2013) "Optogenetic modulation of vibrissal somatosensory cortex via motor and thalamic inputs," *Society for Neuroscience Abstracts,* 167.12/PP7
125. F. Asgarian, M. Hashemi, W. Cartagena, S. Hao, **K. Oweiss**, (2013) "A wireless neural recording system for freely behaving primates," *Society for Neuroscience Abstracts,* 567.06/GGG33

126. S. El-Dawlatly, M. Aghagolzadeh, A. Mohebi, **K. Oweiss**, (2012) "Beyond single neuron responses: Networks capture ensemble coding properties and re-organization in cortex ". *Society for Neuroscience Abstracts.* pp. 413.07
127. A. Mohebi, **K. Oweiss**, (2012) "Ensemble dynamics underlying sensorimotor integration in the rat medial PreFrontal Cortex (mPFC) ". *Society for Neuroscience Abstracts.* pp. 597.18.
128. J. Daly, A. Eleryan and **K. Oweiss** (2012) "JAVA Neural Circuit Simulator (JiNCS): A flexible, open-source framework for simulating networks of spiking cells with various stimulation modalities". *Society for Neuroscience Abstracts.* pp. 712.16.
129. A. Tomaswick, K. Takahashi, M. Saleh, N. Hatsopoulos, **K. Oweiss**, (2012) "Graph model analysis of monkey arm kinematics during reach-to-grasp ". *Society for Neuroscience Abstracts.* pp. 584.17.
130. A. Eleryan A. Dickey, N. Hatsopoulos, **K. Oweiss**, (2012) "Stability analysis of chronically recorded multiple single unit activity in the non-human primate ". *Society for Neuroscience Abstracts.* pp. 277.08.
131. **F.** Asgarian Farzad , M. Kiani, M. Aghagolzadeh, A. Tomaswick, M. Ghovanloo, **K. Oweiss**, (2012) "A wireless implantable neural interface system for intracortical neural recording in freely behaving subjects " *Society for Neuroscience Abstracts.* pp. 277.18
132. A. Eleryan, A. Dickey, N. Hatsopoulos, **K. Oweiss**, (2012) "Stability Analysis of Chronically Recorded Neural Activity in the Non-Human Primate " *Neural Interfaces Conference Proceedings*
133. *A.* Mohebi, J. Cardin, **K. Oweiss**, (2012) "A cell-type-specific population analysis of optogenetically evoked response in primary visual cortex " *Computational and Systems Neuroscience* Vol. 1. pp. 154.
134. A. Mohebi, **K. Oweiss**, (2011) "Neural ensemble correlates of working memory in the rat medial prefrontal cortex," *Society for Neuroscience Abstracts,* No 833.08
135. A. Mohebi, J. Cardin, **K. Oweiss**, (2011) "A dynamic bayesian network model for up/down states of spontaneous and optogenetically evoked activity in the primary visual cortex," No 626.21
136. A. Aghagolzadeh, J. Cardin, **K. Oweiss**, (2011) "A graphical maximum entropy model for predicting stimulus-driven spatiotemporal spiking patterns of V1 cortical neurons," No. 626.15
137. J. Daly, J. Liu, H.Khalil, **K. Oweiss,** "Neural feedback for instantaneous spatiotemporal modulation of afferent pathways in bi-directional brain machine interfaces" No. 280.21, Nov 2011
138. S. Eldawalty, **K. Oweiss**, (2011) "Inferring stimulus-specific network dynamics associated with experience-dependent plasticity in the rat somatosensory cortex following sensory deprivation," No 74.22, Nov 2011
139. S. Eldawalty, M. Aghagolzadeh & **K. Oweiss**, (Invited) (2011) "Probabilistic graphical models of functional and effective neuronal connectivity" *Joint Statistical Meeting Society*
140. S. Eldawlatly, **K. Oweiss,** (2011) "Stimulus-specific neuronal circuits in the rat somatosensory cortex*,"Society for Neuroscience Abstracts*, No 782.19
141. J. Liu, H.Khalil, **K. Oweiss,** (2010) "Feedback Control of the Spatiotemporal Firing Patterns of a Basal Ganglia Microcircuit Model," *Society for Neuroscience Abstracts*, No 820.18
142. M. Aghagolzadeh, F. Zhang, **K. Oweiss**, (2010) "An implantable architecture for real time unsupervised spike sorting in cortically-controlled brain machine interfaces**"** *Society for Neuroscience Abstracts*, No 85.10
143. S. Eldawlatly, **K. Oweiss,** (2010) "Causal Networks in the Rat Barrel Cortex Provide a Signature of Stimulus Encoding," *39th Neural Interfaces Conference*, Long Beach, CA
144. F. Zhang, M. Aghagolzadeh, A. Kamboh, M. Kiani, A. Mason, M. Ghovanloo, and **K. Oweiss,** , (2010) "A Wireless and Reconfigurable Compressive Sensing System for Neural Recording in Cortical Brain Machine Interfaces," *39th Neural Interfaces Conference*, Long Beach, CA
145. M. Aghagolzadeh, F. Zhang, **K. Oweiss**, (2010) "An Implantable VLSI Architecture for Real Time Spike Sorting," *39th Neural Interfaces Conference*, Long Beach, CA
146. J. Liu, H.Khalil, **K. Oweiss**, (2010) ''Feedback Control of the Spatiotemporal Firing Pattern of a Basal Ganglia Microcircuit Model," *39th Neural Interfaces Conference*, Long Beach, CA
147. K.Y. Kwon, **K. Oweiss**, (2010) "NeuroQuest: A Comprehensive tool for Large Scale Neural Data Analysis," *39th Neural Interfaces Conference*, Long Beach, CA
148. S. Eldawlatly, S. Fujisawa, G. Buzsáki, **K. Oweiss,** (2009) "Identifying position-specific functional networks in the rat medial prefrontal cortex," *Society for Neuroscience Abstracts*, No 192.9

149. M. Aghagolzadeh , S. Eldawlatly, **K. Oweiss**, (2009) "The role of higher-order interactions between cortical neurons in a model of sensorimotor integration," *Society for Neuroscience Abstracts*, No 789.11.
150. K. Y. Kwon, S. Eldawlatly, **K. Oweiss**, (2009) "NeuroQuest: A comprehensive tool for large scale neural signal processing and analysis," *Society for Neuroscience Abstracts*, No 790.10
151. F. T. Abu-Nimeh, M. Aghagolzadeh, **K. Oweiss**, (2009) "Real-time, on-chip spike sorting and firing rate estimation for cortically-controlled Brain Machine Interface applications," *Society for Neuroscience Abstracts*, No 181.14
152. M. Aghagolzadeh, **K. Oweiss**, (2008) "Identification and tracking of functional plasticity in motor neuronal ensembles improves the performance of population decoders," *Society for Neuroscience Abstracts*, No 862.19
153. S. El-Dawlatly, **K. Oweiss**, (2008) "A two-stage paradigm for reconstructing functional neuronal circuits from spike train ensembles," *Society for Neuroscience Abstracts*, No 862.15
154. S. Eldawlatly, R. Jin, **K. Oweiss**, (2008) "A Two-Stage Paradigm for Reconstructing Functional Neuronal Circuits" *4th Int. workshop Statistical Analysis of Neural Data (SAND)*, Pittsburgh
155. M. Shetliffe, S. El-Dawlatly, **K. Oweiss**, (2007) "Multiscale compressed sensing of neuronal response properties for brain machine interfaces," *Society for Neuroscience Abstracts*, No 770.2
156. **K. Oweiss**, R. Jin, Y. Suhail, F. Chen (2006) "Identifying functionally interdependent neurons from multielectrode array recordings in local and global network contexts" *in Proc. 5th Substrate-integrated microelectrode Arrays*, pp.60-63, Reutlingen, Germany
157. **K. Oweiss**, R. Jin, Y. Suhail, F. Chen (2006) " Identifying neuronal assemblies with local and global connectivity with spectral clustering in scale space" *in Proc. of 16th Computational Neuroscience (CNS)*, Edinburgh, UK,
158. **K. Oweiss**, (2006) "Compressed sensing of large-scale ensemble neural activity with resource-constrained cortical implants," *Society for Neuroscience Abstracts,* No 13.11
159. **K. Oweiss**, R. Jin, F. Chen, Y. Suhail, (2006) "Identification and tracking of spatial and temporal connectivity of large scale neuronal ensembles from multielectrode recorded mixtures", *NIH Neural Interface Workshop*, Bethesda, MD
160. K. Thomson, S. Chrispell, **K. Oweiss**, (2006) "Compressed Sensing of Large-Scale Cortical Neural Activity," *NIH Neural Interface Workshop*, Bethesda, MD
161. **K. Oweiss,** (2005) "A Systems Approach for Data Compression and Latency Reduction in Advanced Brain Machine Interfaces," *Society for Neuroscience Abstracts*, No 707.13
162. K. Thomson, **K. Oweiss** (2005) "System and Architecture Design for Implantable Neuroprosthetic Devices," *NIH Neural Interface Workshop*, Bethesda, MD
163. Y. Suhail, K. Thomson, **K. Oweiss** (2005) "A Systems Approach for Data Compression and Latency Reduction in Cortically Controlled Brain Machine Interfaces," *NIH Neural Interface Workshop*, Bethesda, MD
164. **K. Oweiss** (2005) "Augmenting Information Channels in Cochlear Implants under Adverse Conditions," *NIH Neural Interface Workshop*, Bethesda, MD
165. Y. Suhail, K. Thomson, L. Slifka, A. Thompson, R. Jin, **K. Oweiss** (2004) "Multiscale Processing and Analysis of High-Density Electrode Array Neural Recordings," *NIH Neural Interface Workshop*, Bethesda, MD
166. **K. Oweiss**, (2002) "Non-parametric detection of unknown correlated multichannel transients with sequential and block hypothesis testing in multiresolution spaces," *2nd IEEE Sensor Array & Multichannel Signal Processing wshp.*,(I):375-378
167. **K. Oweiss**, D.J. Anderson, (2000)"Neural Channel Identification of Multichannel Neural Recordings using Multiresolution Analysis," *Annals of the 22nd Biomedical Engineering Society*, vol. 28 (Suppl. 1): S-116