DEBORAH S. WON

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Education/Training

Post-doctoral	**University of Southern California**, Los Angeles, CA Biomedical Engineering and Neurosurgery, 2007-2008 Supervisors: Dr. Mark Liker and Dr. Mark Humayun
Graduate	**Duke University**, Durham, NC Ph.D., Biomedical Engineering, 2007 Thesis advisor: Dr. Patrick Wolf Dissertation Title: *An Information-Theoretic Analysis of Spike Sorting in a Neuroprosthetic Model*.
Undergraduate	**MIT**, Cambridge, MA B.S., Electrical Engineering and Computer Science, 2000 Minor: Biomedical Engineering Undergraduate advisor: Dr. Stephen Burns

Employment History / Research Experience

2009-present	California State University, Los Angeles, CA *Assistant Professor, Electrical and Computer Engineering*
2007-2008	University of Southern California, Los Angeles, CA *Postdoctoral Research Associate, Biomedical Engineering and Neurosurgery;* *Technical Liason, Biomimetic MicroElectronic Systems Engineering Research Center Industry Program*
2000-2007	Duke University, Durham, NC *Graduate Research Assistant, Biomedical Engineering* *Advisor: Patrick Wolf*
2004	NeuroPace, Mountain View, CA. *Summer Intern, Research Division* *Supervisor: Tom Tcheng, PhD*
1999	Mayo Clinic, Rochester, MN. *Summer Intern, Biomedical Imaging Resource* *Supervisor: Richard Robb, PhD*
2000	MIT, Cambridge, MA *Undergraduate Research Assistant, Artificial Intelligence* *Supervisor: Hugh Herr, PhD*
1999	MIT, Cambridge, MA *Undergraduate Research Assistant, Bioinstrumentation Laboratory* *Supervisor: Sylvain Martel, PhD*

1998 Medtronic, Inc., Minneapolis, MN.
Summer Intern, Heart Failure Management
Supervisor: Jim Carney, PhD

1997 MIT, Cambridge, MA
Undergraduate Research Assistant, Media Lab
Supervisor: Hong Tan, PhD

Awards, Honors, and Professional Societies

- CSULA Research, Scholarship, and Creative Activity Mini-Grant + Creative Leave Awards (2009).
- Hewlett Packard Educational Institution Grant, co-PI, May 2009.
- Team Parkinson grant co-PI, "Use of Quantitative EEG to Assess Cognitive Effects of STN-DBS in Parkinson's Disease" (2008).
- National Science Foundation student fellowship, IEEE EMBS Neural Engineering Conference (2003).
- National Science Foundation graduate research fellowship (2001-2004).
- Biomedical Engineering Society, Member (2009-present, 1999-2003).
- Women in Science and Engineering, Member (2007-present).
- Keck Postdoctoral Association, Member (2007-present).
- Tau Beta Pi Honor Society, Member (2000).
- Eta Kappa Nu (HKN) Engineering Honor Society, Member (1999-2000).

Mentoring and Tutoring Experience

- Summer Pathways to Engineering Program: July 2009.
- Mentor for summer research interns: Summer 2008.
- Science for Life Outreach Project: Fall 2007 – Spring 2008, Murchison Elementary School.
- Tutor, Hillsides tutoring program: Fall 2007 – Summer 2008.
- Pratt Engineering Undergraduate Fellows Program Mentor: Spring 2004 – Spring 2005; Spring 2003.
- Biomedical Instrumentation Laboratory Teaching Assistant: Head TA, Spring 2002. TA, Spring 2001 – Fall 2001.

Technical Skills

- Programming Languages: C, PIC assembly language, Matlab.
- Tools and Systems: LaTeX, LabView, Mentor Graphics IC Design Tools, web authoring.
- Laboratory skills: Animal handling, sterile technique, chronic implant surgical procedure. Certified for conducting human subject research (USC, Collaborative Institutional Training).

Publications

Peer-Reviewed Journal Publications

- Liker MA, Won DS, Rao V, and Hua SE. "Deep brain stimulation: an evolving technology" *Proceedings of the IEEE* 96(7), 2008.
- Won DS, Tiesinga PHE, Henriquez CS, and Wolf PD. "An analytical comparison of the information in sorted and non-sorted cosine-tuned spike activity" *Journal of Neural Engineering* 4:322-335, 2007.
- Won DS and Wolf PD. "A simulation study of information transmission by multi-unit microelectrode recordings" *Network: Computation in Neural Systems* 15: 29-44, 2004.

Submitted or In Preparation

- Won DS, Baker C, and Wolf PD. "A computational study on the effect of firing rate properties on

multi-unit information" *IEEE Transactions on Neural Systems and Rehabilitation Engineering*.

- Liker MA, Won DS, and Hua SE. "Integration of functional neurosurgery and engineering in the development of deep brain stimulation therapy". *IEEE Reviews in Biomedical Engineering.*

Proceedings / Abstracts

- Won DS, Lee R, and Cabral E. "Characterization of deep brain stimulation artifact in cognition-related EEG", US-Korea Conference on Science, Technology, and Entrepreneurship, Raleigh, NC. July 2009.
- Won DS, Velez-Colon JJ, and Liker MA. "The magnitude and direction of DBS electrode deviation computed from fused CT and MR images", American Association of Neurological Surgeons Annual Meeting, San Diego, CA. May 2009.
- Won DS, Hui JS, Togasaki DM, and Liker MA. "Precision of DBS electrode contact localization for motor efficacy and prevention of cognitive side effects", North American Neuromodulation Society Annual Meeting, Las Vegas, NV. Dec 2008.
- Won DS, Liker MA, Humayun MS. "An analysis of the informational benefit of spike sorting under varying noise conditions" 15th Joint Symposium on Neural Computation, Irvine, CA. May 2008.
- Won DS, O'Doherty JE, Carmena JM, Phelps EE, Nicolelis MAL, Henriquez, and Wolf PD. "A Comparison of Linear Predictor Performance Using Unsorted and Sorted Neural Spike Activity" Society for Neuroscience Annual Meeting, San Diego, CA. Oct 2004.
- O'Doherty JE, Won DS, Zacksenhouse M, Lebedev MA, Carmena JM, Nicolelis MAL, Wolf PD, Henriquez CS. "Data reduction of simultaneous multi-electrode neural recordings using principal component analysis" IEEE Biomedical Engineering Society Meeting, Philadelphia, PA. Oct 2004.
- Won DS, Chong DY, and Wolf PD. "Effects of spike sorting error on information content in multi-neuron recordings" 1st International IEEE EMBS Conference on Neural Engineering, Capri Island, Italy. March 2003.
- Morizio J, Won DS, Obeid I, Bossetti C, Nicolelis, and Wolf PD. "16-channel neuro pre-conditioner device" 1st International IEEE EMBS Conference on Neural Engineering. Capri Island, Italy. March 2003.
- Won DS and Wolf PD. "Design of a Switched-Capacitor Filter for an Integrated Circuit NeuroChip" IEEE BMES Conference. Durham, NC. Oct 2001.
- McGinnis M, Marantz A, Mehta J, Won D, and Poeppel D. "An MEG study of lexical decision" Proceedings of the 1997 Canadian Linguistics Association Annual Conference. Calgary Working Papers in Linguistics, 155-165. Department of Linguistics, University of Calgary, 1997.

Non-Peer-Reviewed Publications

- Liker MA and Won DS. "Stem Cells in Neurosurgery Primer", presented by MA Liker at Emerging Technology and Techniques in Neurosurgery Course, Las Vegas, NV. November 2008.
- Won DS. "Advancing neuroprosthetic technology to meet practical needs", Biomimetic MicroElectronic Systems Industrial Advisory Board Newsletter. Fall 2008.
- Won DS and Rhinehart E. "New neurostimulation developments at BMES", Biomimetic MicroElectronic Systems Industrial Advisory Board Newsletter. Fall 2007.
- Mehta S and Won D. "Controlling a Khepera With a 2D Optical Flow Chip" Workshop on Neuromorphic Engineering: Report 2002.

Patent

- Wolf PD and Won DS. "Methods, Systems, and Computer Program Products for Neural Channel Selection in a Multi-channel System" U.S. Patent Publication No. US-2006-0041203-A1. Filing Date: Aug. 20, 2004.

Oral Presentations and Lectures

- "EEG Assessment of Cognitive Effects of DBS". Invited talk, Southern California Movement Society Meeting. Los Angeles, CA. June 2008.
- "Technical Issues in Deep Brain Stimulation". Lecture for BME-552: Neural Implant Engineering, taught by Dr. James Weiland and Prof. Theodore Berger, Spring 2008.
- "Recording Neural Activity". Lecture for BME-552: Neural Implant Engineering, taught by Dr. James Weiland and Prof. Theodore Berger, Spring 2008.
- "Basic Neural Electrophysiology and Population Recording". Lecture for BME-452: Introduction to Biomimetic Neural Engineering, taught by Prof. Michael Khoo and Dr. Tuan Hoang, Fall 2007.
- "An Introduction to Deep Brain Stimulation". Lecture for BME-452: Introduction to Biomimetic Neural Engineering, taught by Prof. Michael Khoo and Dr. Tuan Hoang, Fall 2007.
- "An Introduction to Information Theory". Lecture for Neural Signal Processing, taught by Dr. Patrick Wolf, Fall 2003.
- "A multichannel CMOS analog front end for neural recordings". Invited talk, Second Joint EMBS-BMES Conference. Houston, TX. Oct 2002.

References

- Patrick Wolf, Ph.D. – Department of Biomedical Engineering, Duke University, 136 Hudson Hall, Durham, NC 27705, 919-660-5114, patrick.wolf@duke.edu.
- Paul Tiesinga, Ph.D. – Department of Physics & Astronomy, University of North Carolina, 184 Phillips Hall, Chapel Hill, NC 27599-3255, 919-962-7199, tiesinga@physics.unc.edu.
- Mark Humayun, M.D., Ph.D. – Department of Biomedical Engineering, USC, 1450 San Pablo St., Los Angeles, CA 90033, 323-442-6523, humayun@usc.edu.
- Mark Liker, M.D. – Department of Neurological Surgery, USC, 1200 N. State St., Rm 5046, Los Angeles, CA 90033, 310-738-8250, liker@usc.edu.
- Steven Giannotta, M.D. – Department of Neurological Surgery, USC, 1200 N. State St., Rm 5046, Los Angeles, CA 90033, 310-738-8250, giannott@usc.edu.