

Spencer S. Kellis

Graduate Research Assistant
PhD Candidate

Electrical and Computer Engineering Department
University of Utah
2780 Warnock Engineering Building
72 S Central Campus Dr
Salt Lake City, UT 84112 USA

spencer.kellis@utah.edu
<http://www.eng.utah.edu/~skellis/>
Phone: (801) 783-3791

EDUCATION

Ph.D., Electrical Engineering University of Utah – Salt Lake City, UT	2011 (Expected)
M.S., Electrical Engineering University of Utah – Salt Lake City, UT	2009
B.S., Electrical Engineering Brigham Young University – Provo, UT	2006

PROFESSIONAL EXPERIENCE

Intern, Blackrock Microsystems , Salt Lake City, UT Digital filters for brain-computer interfaces	2008
Intern, Intel Corporation , Sacramento, CA Desktop Validation Group	2004

RESEARCH INTERESTS

- Signal processing for brain-computer interfaces
- Algorithms for decode and classification of sensed neural activity
- VLSI design for low-power integrated sensing microsystems

AWARDS AND HONORS

- | | |
|---|------|
| • Graduate Research Fellowship, University of Utah | 2011 |
| • Article selected for Highlights of 2010, Journal of Neural Engineering | 2010 |
| • 1st Place Podium Competition, Mountain West Biomedical Engineering Conference | 2009 |
| • Best Paper, Symposium on Application Specific Processors | 2008 |
| • Member, Honor Society of Phi Kappa Phi | |
| • Member, Golden Key International Honour Society | |

- Eagle Scout

SERVICE

- | | |
|---|---------|
| • Secretary, IEEE student branch (University of Utah) | 2011-12 |
| • Chair, IEEE student branch (University of Utah) | 2010-11 |
| • Vice-chair, IEEE student branch (University of Utah) | 2009-10 |
| • Web master, Golden Key Student Branch (University of Utah) | 2008-09 |
| • President, LDS Student Engineering Association (University of Utah) | 2007-08 |

PROFESSIONAL MEMBERSHIP

- IEEE
- Society for Neuroscience

PUBLICATION AND PRESS

JOURNAL ARTICLES

1. Kellis S., Miller K., Thomson K.E., Brown R., House P., Greger B., "Decoding spoken words using local field potentials recorded from the cortical surface," 2010 *J. Neural Eng.* 7 056007
This paper was selected for the JNE's Highlights of 2010 because "it received some of the highest praise from our referees and a high number of downloads from the journal website during 2010"
2. Kellis S.S., House P.A., Thomson K.E., Brown R., Greger B., "Human neocortical electrical activity recorded on nonpenetrating microwire arrays: applicability for neuroprostheses," *Neurosurg Focus*, vol. 27, p. E9, Jul 2009.
3. Henrie J., Kellis S., Schultz S., Hawkins A., "Electronic color charts for dielectric films on silicon," *Opt Express*, vol. 12, pp. 1464-9, Apr 5 2004.

REFEREED CONFERENCE PAPERS

1. Kellis S., Greger B., Hanrahan, S., House, P., Brown R., "Sensing millimeter-scale dynamics in cortical surface potentials for neural prosthetics," Accepted for presentation at IEEE Sensors, 28-31 October 2011, Limerick, Ireland.
2. Kellis S., Greger B., Hanrahan, S., House, P., Brown R., "Platinum microwire for subdural electrocorticography over human neocortex: millimeter-scale spatiotemporal dynamics," *Conf Proc IEEE Eng Med Biol Soc*, vol. 1, pp 4761-65, 2011.
3. Redd B., Kellis S., Gaskin N., Brown R., "Scratchpad memories in the context of process scaling," 54th Midwest Symposium on Circuits and Systems, 2011.

4. Kellis S., Miller K., Thomson K., Brown R., House P., Greger B., "Classification of spoken words using surface local field potentials," Conf Proc IEEE Eng Med Biol Soc, vol. 1, pp 3827-30, 2010
5. Kellis S., Gaskin N., Redd B., Campbell J., Brown R., "Energy profile of a microcontroller for neural prosthetic application," in Circuits and Systems (ISCAS), Proceedings of 2010 IEEE International Symposium on, 2010, pp. 3841-3844.
6. Kellis S., Gaskin N., Redd B., Marsman E., Brown R., "Hybrid On-Chip Clocking for Sensor Nodes," presented at the International Symposium on System-on-Chip 2010, Tampere, Finland, 2010.
7. Kellis S., House P., Marsman E., Senger R., Gaskin N., Thomson K.E., Greger B., Brown R., "An Embedded System for Neural Prosthetics," presented at the 18th IEEE/IFIP International Conference on VLSI and System-on-Chip (VLSI-SoC), Florianópolis, Brazil, 2009.
8. Baker J., Bishop W., Kellis S., Levy T., House P., Greger B., "Multi-scale recordings for neuroprosthetic control of finger movements," Conf Proc IEEE Eng Med Biol Soc, vol. 2009, pp. 4573-7, 2009.
9. Spjut J., Boulos S., Kopta D., Brunvand E., Kellis S., "TRaX: A Multi-Threaded Architecture for Real-Time Ray Tracing," in Application Specific Processors, 2008. SASP 2008. Symposium on, 2008, pp. 108-114.

PRESENTATIONS

1. Kellis S., House P., Thomson K.E., Brown R., and Greger B., "Human neocortical electrical activity recorded on nonpenetrating microwire arrays: applicability for neuroprostheses," 5th Annual Mountain West Biomedical Engineering Conference, Park City, UT, September 11-12, 2009.
1. Kellis S., House P., Thomson K.E., Brown R., and Greger B., "Neuroprosthetic application of human neocortical electrical activity recorded on nonpenetrating microwire arrays," Society for Neuroscience Annual Meeting, Chicago, IL, October 17-21, 2009, Abstract 216.10.

INVITED PRESENTATIONS

1. "Classification of speech from field potentials recorded on nonpenetrating microwires," 2nd Global COE International Symposium, Electronic Devices Innovation (EDIS 2009), Osaka, Japan, Feb 2-3 2010.

POSTERS

1. Kellis S., Hanrahan S., Brown R., House P., Greger B., "Exploiting millimeter-scale spatiotemporal dynamics in cortical surface potentials for brain-computer interfaces," Society for Neuroscience Annual Meeting, Washington, D.C., November 12-16, 2011, Abstract 280.23/OO24.
2. Smith E., Kellis S., Greger B., "Coding of stimulus identity at early stages in the processing stream for auditory object identity," Society for Neuroscience Annual Meeting, Washington, D.C., November 12-16, 2011, Abstract 480.18/LL12.
3. Afra P., Hanrahan S., Kellis S., Greger B., House P., "Non ictal onset zone: a window to ictal dynamics," American Epilepsy Society Annual Meeting, December 2-6, 2011, Poster 1.143.

4. Kellis S., Miller K., Thomson K.E., Brown R., House P., Greger B., "Decoding spoken words using local field potentials recorded from the cortical surface," Neural Engineering, Science, and Technology (NEST) Forum, San Diego, CA, November 18-20, 2010.
5. Kellis S., Miller K., Thomson K.E., Hanrahan S., Brown R., House P., Greger B., "Using micro-electrodes to record surface local field potentials from human neocortex for neural prosthetic applications," Society for Neuroscience Annual Meeting, San Diego, CA, November 13-17, 2010, Abstract 295.21.

TECHNICAL PRESS AND NEWS RELEASES

2. "Thinking Cap: Tiny Electrodes Could Help Paralyzed People Move," Megapixels, *Popular Science*, vol. 275, no. 5, pp. 16-17, November 2009.
3. "The Brain Speaks: Engineers Decode Words from Brain Signals," University of Utah College of Engineering Newsletter, December 2010.
4. "The Brain Speaks: Scientists Decode Words from Brain Signals," University of Utah News Release, Sept. 6, 2010.
5. "Reading the Brain without Poking It: New Electrodes May Help Amputees and Paralyzed," University of Utah News Release, June 28, 2009.