

Curriculum Vitae

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Personal

Born: September 27th, 1979, Manhasset, NY.
Citizenship: USA

Education

- 2009, Postdoctoral researcher, University of Pennsylvania.
- 2004–2008, Ph.D., University of Pennsylvania (Neuroscience). Adviser: Dr. Michael Kahana. Thesis: *Brain oscillations as a window into human cognition*.
- 2001–2002, M.Eng., Massachusetts Institute of Technology (Computer Science). Adviser: Dr. Larry Rudolph. Thesis: *Improving memory performance through runtime optimization*.
- 1997–2001, S.B., Massachusetts Institute of Technology (Computer Science).

Professional

- 2009 & 2010, Director of the University of Pennsylvania's Undergraduate Summer Training Program in Computational Neuroscience.
- 2009, Spring semester, Teaching Assistant for *Brain–Computer Interfaces (BE-421/521)*, University of Pennsylvania.
- 2006, Fall semester, Teaching Assistant for *Cellular Neurobiology (BBB-251)*, University of Pennsylvania.
- 2003–2004, Research Assistant, Kahana Lab, Brandeis University.
- 2002–2003, Senior Unix Software Developer, Bloomberg L.P., NY.

Publications

- **Jacobs, J.**, Manning, J.R., Kahana, M.J. (2010). Response to Miller: “Broadband” vs. “high gamma” electrocorticographic signals. *The Journal of Neuroscience*. 30, online.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. (2010). A sense of direction in human entorhinal cortex. *Proceedings of the National Academy of Sciences*. 107(14), 6487–6492.
- **Jacobs, J.**, Kahana, M.J. (2010). Direct brain recordings fuel advances in cognitive electrophysiology. *Trends in Cognitive Sciences*. 14(4), 162–171.
- **Jacobs, J.**,* Korolev, I.O.,* Caplan, J.B., Ekstrom, A.D., Litt, B., Baltuch, G., Fried, I., Schulze-Bonhage, A., Madsen, J. R., & Kahana, M.J. (2010). Right-lateralized brain oscillations in human spatial navigation. *Journal of Cognitive Neuroscience*. 22(5), 824–836. (* equal contributions.)
- Manning, J.R., **Jacobs, J.**, Fried, I., & Kahana, M.J. (2009). Broadband shifts in LFP power spectra are correlated with single-neuron activity in humans. *The Journal of Neuroscience*. 29(43), 13613–3620.
- **Jacobs, J.**, & Kahana, M.J. (2009). Neural representations of individual stimuli revealed by gamma-band electrocorticographic activity. *The Journal of Neuroscience*, 29(33), 10203–10214.

- Geller, A.S., Schleifer, I.K., Sederberg, P.B., **Jacobs, J.**, & Kahana, M.J. (2007). PyEPL: A cross-platform experiment-programming library. *Behavior Research Methods*, 39(4), 950–958.
- Ekstrom, A., Viskontas, I., Kahana, M.J., **Jacobs, J.**, Upchurch, K., Bookheimer, S., & Fried, I. (2007). Contrasting roles of single neuron activity and local field potentials in human memory. *Hippocampus*, 17(8), 606–17.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D. & Fried, I. (2007). Brain oscillations control timing of single-neuron activity in humans. *The Journal of Neuroscience*, 27(14), 3839–3844.
- **Jacobs, J.**, Hwang-Grodzins, G., Curran, T., & Kahana, M.J. (2006). EEG oscillations and recognition memory: Theta correlates of memory retrieval and decision making. *NeuroImage*, 32, 978–987.
- Hwang-Grodzins, G., **Jacobs, J.**, Geller, A., Danker, J., Sekuler, R., & Kahana, M.J. (2005). EEG correlates of verbal and nonverbal working memory. *Behavioral and Brain Functions*, 1:20.
- Kahana, M.J. & **Jacobs, J.** (2000). Inter-response times in serial recall: Effects of intraserial repetition. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 26, 1188–1197.
- **Jacobs, J.** (1998). Reaction time in serial memory: A re-examination of the Ranschburg effect. *Journal of Undergraduate Sciences*, 5(1), 65–69.

Working papers

- Lega, B., **Jacobs, J.**, & Kahana, M.J. Human hippocampal theta oscillations and the formation of episodic memories. *In revision for J. Neurosci.*
- **Jacobs, J.***, Lega, B.* & Anderson, C. Explaining how brain stimulation can evoke remote memories. *In Preparation.* (* equal contributions.)

Podium presentations

- Lega, B., **Jacobs, J.**, & Kahana, M.J. Human Hippocampal Theta Oscillations and the Formation of Episodic Memories. *Cognitive Neuroscience Society Annual Meeting*, 2010.
- Zaghoul, K.A., Burke, J.F., **Jacobs, J.**, & Kahana, M.J. Differential theta and gamma coherence associated with successful memory encoding. Program No. 503.10. *2009 Abstract and Itinerary Planner*, Chicago, IL: Society for Neuroscience, 2009. Online.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. Representation of direction and location in human entorhinal cortex. Program No. 118.3. *2008 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2008. Online.
- **Jacobs, J.**, & Kahana, M.J. Spatial patterns of gamma oscillations in humans encode cognitive stimuli. *Neural Information Processing Systems: Large-scale Brain Dynamics Workshop*. Whistler, BC, Canada, Dec. 2007.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. A sense of direction in human entorhinal cortex. *University of Pennsylvania Behavioral and Cognitive Neuroscience Retreat*, Philadelphia, PA, Oct. 2007.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., & Fried, I. Phase locking of neuronal activity and EEG oscillations during human spatial navigation. Program No. 581.4. *2005 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2005. Online.
- Ekstrom, A.D., Viskontas, I., Kahana, M.J., **Jacobs, J.**, Upchurch, K., Bookheimer, S., & Fried, I. Contrasting human hippocampal single cell responses and local field potentials in a virtual navigation and episodic recognition task. Program No. 814.10. *2005 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2005. Online.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., & Fried, I. Phase locking of neuronal activity and EEG oscillations during human spatial navigation. *Penn-Princeton Graduate Student Symposium on Cognitive Neuroscience*. Princeton, NJ, Oct. 2005.

Poster presentations

- **Jacobs, J.**, Ungar, L.H. & Kahana, M.J. ECoG correlates of specific human cognitive representations. *Computational Cognitive Neuroscience*, Boston, MA, 2009.

- **Jacobs, J.**, Ungar, L.H. & Kahana, M.J. Gamma-band ECoG correlates of human cognitive representations. Program No. 279.2. *2009 Abstract and Itinerary Planner*, Chicago, IL: Society for Neuroscience, 2009. Online.
- Manning, J.R., **Jacobs, J.**, Fried, I., & Kahana, M.J. Broadband shifts in EEG power spectra are correlated with single-neuron activity in humans. Program No. 397.6. *2008 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2008. Online.
- Manning, J.R., **Jacobs, J.**, Fried, I., & Kahana, M.J. Broadband shifts in EEG power spectra are correlated with single-neuron activity in humans. *Society for Mathematical Psychology Annual Meeting*, 2008. Washington, D.C.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. Human entorhinal neurons encode movement direction. Program No. 422.8. *2007 Abstract and Itinerary Planner*, San Diego, CA: Society for Neuroscience, 2007. Online.
- Mollison, M.V., Weidemann, C.T., **Jacobs, J.**, Korolev, I.O., & Kahana, M.J. Oscillatory correlates of implicit landmark recognition during virtual navigation. Program No. 422.9. *2007 Abstract and Itinerary Planner*, San Diego, CA: Society for Neuroscience, 2007. Online.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., & Fried, I. Oscillatory synchronization of human single-neuron activity and local-field potentials. *Coherent Behavior in Neuronal Networks*, Mallorca, Spain, 2007.
- Ellner, S., Kahana, M.J., **Jacobs, J.**, Kearns, M., & Fried, I. Using machine learning for the prediction of cognitive state: How virtual navigation illustrates fundamental cellular mechanisms. *Cognitive Neuroscience Society Annual Meeting*, 2007.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. Human entorhinal neurons encode route information. *Cognitive Neuroscience Society Annual Meeting*, 2007.
- Mollison, M., **Jacobs, J.**, Korolev, I.O., & Kahana, M.J. An EEG study of implicit landmark recognition during virtual navigation. *Cognitive Neuroscience Society Annual Meeting*, 2007.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., Mollison, M., & Fried, I. Representation of movement direction in the human entorhinal cortex. No. 259. *Computational and Systems Neuroscience (Cosyne) 2007*. Salt Lake City, UT.
- **Jacobs, J.**, Kahana, M.J., Ekstrom, A.D., & Fried, I. Oscillatory synchronization of human single-neuron activity during spatial navigation. Program No. 366.9. *2006 Abstract and Itinerary Planner*, Atlanta, GA: Society for Neuroscience, 2006. Online.
- Ekstrom A.D., Viskontas I., Kahana M.J., **Jacobs, J.**, Upchurch K., Bookheimer S., & Fried I. Dissociation of cellular firing rate and local field potentials during memory encoding and retrieval in the human medial temporal lobe. Program No. 366.8. *2006 Abstract and Itinerary Planner*, Atlanta, GA: Society for Neuroscience, 2006. Online.
- Mollison, M.V., **Jacobs, J.**, Korolev, I.O., & Kahana, M.J. Event-related potentials to landmarks during “Yellow Cab” — a virtual spatial navigation task. *Society for Mathematical Psychology Annual Meeting*, 2006. Vancouver, BC, Canada.
- Korolev, I.O., **Jacobs, J.**, Mollison, M.V., & Kahana, M.J. Human oscillatory activity during virtual navigation: a comparison between scalp and intracranial recordings. Program No. 65.16. *2005 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2005. Online.
- Hwang, G., **Jacobs, J.**, Danker, J., Sekuler, R., & Kahana, M.J. Neural correlates of verbal and non-verbal memory in working memory. Program No. 65.21. *2005 Abstract and Itinerary Planner*, Washington, DC: Society for Neuroscience, 2005. Online.
- **Jacobs, J.**, Hwang, G., Curran, T., & Kahana, M.J. EEG Oscillations Illustrate Cortical Roles in Memory Retrieval. *Cognitive Neuroscience Society Annual Meeting*, 2005.
- Hwang-Grodzins, G., **Jacobs, J.**, Danker, J., Sekuler, R., & Kahana, M.J. Neural correlates of verbal and non-verbal memory in a modified Sternberg Task. *Cognitive Neuroscience Society Annual Meeting*, 2005.
- **Jacobs, J.**, Hwang-Grodzins, G., Curran, T., & Kahana, M.J. Oscillatory Correlates of Verbal Working Memory. Program No. 433.18. *2004 Abstract and Itinerary Planner*, San Diego, CA: Society for Neuroscience, 2004. Online.

Unpublished manuscripts

- **Jacobs, J.**, Wortman, J., Kearns, M., Kahana, M., & Fried, I. Machine learning for multi-cell human intent inference.

Awards

- Computational Cognitive Neuroscience Annual Meeting, selected as one of the top posters (2009).
- Saul Winegrad, M.D., Award for Outstanding Dissertation (2009).
- Westinghouse (Intel) Science Talent Search Finalist (1997).
- International Science and Engineering Fair, Second Place in Social Science (1997).
- International Science and Engineering Fair, Naval Science Award (1997).

Funding

- NIH Neuroimaging training grant postdoctoral fellowship (1/2009–present).
- NIH predoctoral National Research Service Award (5/2008–12/2008).
- NIH Computational Neuroscience Training fellowship (5/2007–4/2008).
- NSF Integrative Graduate Education and Research Traineeship (IGERT) fellowship (11/2005–5/2007).

Professional Society Memberships and Service

- Member: Society for Neuroscience (2003–present), Cognitive Neuroscience Society (2004–present).
- Ad-hoc peer reviewer: *Current Biology*, *Human Brain Mapping*, *NeuroImage*, *The Journal of Neuroscience*, *Science*.

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