

Joshua Jacobs, Ph.D.

Contact

Columbia University
Fu Foundation School of Engineering and Applied Sciences (SEAS)
Department of Biomedical Engineering
1210 Amsterdam Avenue, #8904
New York, NY 10027
Phone: 212-854-2445
Fax: 212-854-8725
E-mail: joshua.jacobs@columbia.edu
Lab website: <http://www.jacobslab.org/>
Twitter: @neurojosh
Google Scholar profile: <https://scholar.google.com/citations?user=XQJh51oAAAAJ>

Professional

- 2021–present, Associate Professor (tenured), Department of Biomedical Engineering, Fu Foundation School of Engineering and Applied Science, Columbia University.
 - Member of Doctoral Program in Neurobiology and Behavior, Translational Neuroscience Initiative, and Data Science Institute.
 - Affiliate of Zuckerman Mind Brain Behavior Institute (ZMBBI).
- 2019–2020, Associate Professor (tenure track), Department of Biomedical Engineering, Fu Foundation School of Engineering and Applied Science, Columbia University.
- 2015–2019, Assistant Professor, Department of Biomedical Engineering, Fu Foundation School of Engineering and Applied Science, Columbia University.
- 2010–2014, Assistant Professor, School of Biomedical Engineering and Department of Psychology, Drexel University.
- 2009–2010, Postdoctoral researcher, University of Pennsylvania.
- 2002–2003, Senior Unix Software Developer, Bloomberg L.P., NY.

Education

- 2004–2008, Ph.D., University of Pennsylvania (Neuroscience). Thesis: *Brain oscillations as a window into human cognition*. Winegrad award for best dissertation in Neuroscience.
- 2001–2002, M.Eng., Massachusetts Institute of Technology (Computer Science). Thesis: *Improving memory performance through runtime optimization*.
- 1997–2001, S.B., Massachusetts Institute of Technology (Computer Science).

Manuscripts Invited

- **Jacobs, J.** (Commissioned by editor.) Functional properties of traveling waves in the human brain. *Trends in Cognitive Sciences*.

Preprints

3. Long, L., Yang, M., Kriegeskorte, N., **Jacobs, J.**, Remez, R., Sperling, M., Sharan, A., Lega, B., Burks, A., Worrell, G., Gross, R., Jobst, B., Davis, K., Zaghoul, K., Sheth, S., Stein, J., Das, S., Gorniak, R., Wanda, P., Kahana, M., Mesgarani, N. Feed-forward, feed-back, and distributed feature representation during visual word recognition revealed by human intracranial neurophysiology. Preprint: <https://www.researchsquare.com/article/rs-95141/v1>

2. Umbach, G., Rugg, M., Worrell, G., Sperling, M., Gross, R., Jobst, B., **Jacobs, J.**, Zaghoul, K., Stein, J., Davis, K., & Lega, B. Intracranial EEG reveals bihemispheric parietal and extra parietal brain networks supporting mental arithmetic. Preprint: <https://www.biorxiv.org/content/10.1101/542142v1.abstract>
1. Maidenbaum, S., Patel, A., Carlin, I., & **Jacobs, J.**. Studying Spatial Memory in Augmented and Virtual Reality. Preprint: <https://www.biorxiv.org/content/10.1101/777946v1>.

Peer-Reviewed Publications

48. Kunz, L., Brandt, A., Reinacher, P.C., Staresina, B.P., Reifensstein, E., Weidemann, C.T., Herweg, N.A., Tsitsiklis, M., Kempfer, R., Kahana, M.J., Schulze-Bonhage, A., **Jacobs, J.** (in press). A neural code of egocentric spatial information in human medial temporal lobe. *Neuron*.
47. Qasim, S., Fried, I., **Jacobs, J.** (2021). Phase precession in the human hippocampus and entorhinal cortex. *Cell*. 184, 12, 3242–3255.
46. Umbach, G., Katak, P., **Jacobs, J.**, Kahana, M.J., Pfeiffer, B., Sperling, M.R., Lega, B. (2020). Time cells in the human hippocampus and entorhinal cortex support episodic memory. *Proceedings of the National Academy of Sciences*. 117, 45, 28463–28474.
45. Goyal, A., Miller, J., Qasim, S.E., Watrous, A.J., Stein, J., Inman, C., Gross R., Willie, J. T., Lega, B., Lin, J.-J., Sharan, A., Wu, C, Sperling, M.R., Sheth, S., McKhann, G., Smith, E.H., Schevon, C., & **Jacobs, J.*** (2020). *Nature Communications*. Functionally distinct high and low theta oscillations in the human hippocampus. 11, 1, 1–10. Selected for inclusion in Nature Communication’s special focus on [Brain and Behavior](#).
44. Mohan, U. R., Watrous, A., Miller, J., Lega, B., Sperling, M.R., Worrell, G. A., Gross, R. E., Zaghoul, K., Jobst, B. C. Davis, K. A., Sheth, S. A., Stein, J.M., Das, S.R., Gorniak, R., Wanda, P. A., Rizzuto, D., Kahana, M. J., & **Jacobs, J.*** (2020). *Brain Stimulation*. The effects of direct brain stimulation in humans depend on frequency, amplitude, and white-matter proximity. 13, 5, 1183–1195.
43. Maidenbaum, S., Patel, A., Gedankien, T., **Jacobs, J.*** (2020). The Effect of Navigational Aids on Spatial Memory in Virtual Reality. *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, 645–646.
42. Tsitsiklis, M., Miller, J., Qasim, S., Inman, C., Gross, R., Willie, J., Smith, E., Sheth, S., Schevon, C., Sperling, M., Sharan, A., Stein, J., & **Jacobs, J.*** (2020). Single-neuron representations of spatial targets in humans. *Current Biology*, 30, 1–9.
41. Qasim, S.E., Miller, J., Inman, C., Gross R., Willie, J. T., Lega, B., Lin, J.-J., Sharan, A., Wu, C, Sperling, M.R., Sheth, S., McKhann, G., Smith, E.H., Schevon, C., Stein, J., & **Jacobs, J.*** (2019). Memory retrieval modulates spatial tuning of single neurons in the human entorhinal cortex. *Nature Neuroscience*. 22, 2078–2086. **Featured on the December 2019 cover.**
40. Maidenbaum, S., Patel, A., Stein, E., & **Jacobs, J.*** (2019). Spatial Memory Rehabilitation in Virtual Reality: Generalizing from Epilepsy Patients to the General Population. *IEEE: Proceedings of the 13th International Conf. on Virtual Rehab*. WG Wright, S Subramanian, G Fluet, M Agmon, RM Proffitt, M Roberts (Eds), Tel Aviv, Israel, 21–24 July, 2019. **Awarded best paper.**
39. Kunz, L., Maidenbaum, S., Chen, D., Wang, L.,* **Jacobs, J.*** & Axmacher, N.* (2019). Observing the neural code of spatial navigation via large-scale electrophysiology. *Trends in Cognitive Sciences*. 23, 7, 615–630. (* equal senior authors.)
38. Maidenbaum, S., Miller, J., Stein, J.M., & **Jacobs, J.*** (2018). Grid-like hexadirectional modulation of human entorhinal theta oscillations. *Proceedings of the National Academy of Sciences*. 115, 42, 10798–10803
37. Staudigl, T., Leszczynski, M., **Jacobs, J.**, Sheth, S., Schroeder, C.E., Jensen, O., & Doeller, C.* (2018). Hexadirectional modulation of high-frequency electrophysiological activity in the human anterior medial temporal lobe maps visual space. *Current Biology*. 28, 1–5.

36. Zhang, H., Watrous, A.J., Patel, A., & **Jacobs, J.*** (2018). Theta and alpha oscillations are traveling waves in the human neocortex. *Neuron*. 98, 6, 1269–1281.
35. Miller, J.F., Watrous, A.J., Tsitsiklis, M., Lee, S.A., Sheth, S., Schevon, C.A., Smith, E., Sperling, M.R., Sharan, A., Asadi-Pooya, A.A., Worrell, G., Meisenhelter, S., Inman, C., Davis, K.A., Lega, B., Wanda, P., Das, S.R., Stein, J.M., Gorniak, R., & **Jacobs, J.*** (2018). Lateralized hippocampal oscillations underlie distinct aspects of human spatial memory and navigation. *Nature Communications*. 9, 1, 2423.
34. Bahramisharif, A., Jensen, O.,* **Jacobs, J.*** & Lisman, J.* (2018). Properties of oscillations underlying working memory at content-specific cortical sites. *Public Library of Science: Biology*. 16, 8, e2003805. (* equal senior authors.)
33. Watrous, A.J., Miller, J., Qasim, S., Fried, I., **Jacobs, J.*** (2018). Phase-tuned neuronal firing encodes human contextual representations for navigational goals. *eLife*, 7, e32554.
32. Goyal, A., Miller, J., Watrous, A.J., Lee, S.A., Coffey, T., Sperling, M., Sharan, A., Worrell, G., Berry, B., Lega, B., Jobst, B.C., Davis, K., Gross, R., Sheth, S., Ezzyat, Y., Das, S., Stein, J., Gorniak, R., Wanda, P., & **Jacobs, J.*** (2018). Electrical stimulation in hippocampus and entorhinal cortex impairs spatial and temporal memory. *The Journal of Neuroscience*. 38, 19, 4471–4481.
31. Lee, S.A., Miller, J., Watrous, A., Sperling, M., Sharan, A., Worrell, G., Berry, B., Jobst, B., Davis, K., Gross, R., Lega, B., Sheth, S., Das, S., Stein, J., Gorniak, R., Rizzuto, D., & **Jacobs, J.*** (2018). Electrophysiological signatures of spatial boundaries in the human subiculum. *The Journal of Neuroscience*. 38, 13, 3265–3272.
30. **Jacobs, J.***, Lega, B., & Watrous, A. (2017). Human hippocampal theta oscillations: Distinctive features and interspecies commonalities. In: *The Hippocampus from Cells to Systems: Structure, Connectivity, and Functional Contributions to Memory and Flexible Cognition*, eds. Hannula, D., Duff, M., 37–67.
29. **Jacobs, J.***, Miller, J., Lee, S.A., Coffey, T., Watrous, A.J., Sperling, M. R., Sharan, A., Worrell, G., Berry, B., Lega, B., Jobst, B., Davis, K. Gross, R. E., Sheth, S. A., Ezzyat, Y., Das, S. R., Stein, J., Gorniak, R., Kahana, M. J., & Rizzuto, D. S. (2016). Direct electrical stimulation of human entorhinal cortex impairs memory. *Neuron*. 92, 5, 983–990.
28. Zhang, H. & **Jacobs, J.*** (2015). Travelling theta waves in the human hippocampus. *Journal of Neuroscience*, 35, 36, 12477–12487.
27. Miller, J., Fried, I.F., Suthana, N., & **Jacobs, J.*** (2015). Repeating spatial activations in human entorhinal cortex. *Current Biology*, 25, 8, 1080–1085.
26. van der Meij, R., **Jacobs, J.**, & Maris, E*. (2015) Uncovering phase-coupled oscillatory networks in electrophysiological data. *Human Brain Mapping*, 36, 7, 2655–2680.
25. Burke, J. F., Merkow, M., **Jacobs, J.**, Kahana, M. J., & Zaghoul, K*. (2015). Brain computer interface to enhance episodic memory in human participants. *Frontiers in Human Neuroscience*, 8, 1055.
24. Lega, B. C., Burke, J. F., **Jacobs, J.**, & Kahana, M. J.* (2014). Slow theta-to-gamma phase amplitude coupling in human hippocampus supports the formation of new episodic memories. *Cerebral Cortex*.
23. Ritaccio, A., Brunner, P., Gunduz, A., Hermes, D., Hirsch, L., **Jacobs, J.**, Kamada, K., Kastner, S., Knight, R.T., Lesser, R., Miller, K., Sejnowski, T., Worrell, G., & Schalk, G. (2014). Proceedings of the Fifth International Workshop on Advances in Electrocoricography. *Epilepsy and Behavior* 41, 183–192.
22. Misra, A., Burke, J.F., Ramayya, A., **Jacobs, J.**, Sperling, M.R., Moxon, K., Kahana, M., Evans, J., & Sharan, A.D. (2014). Methods for implantation of micro-wire bundles and optimization of single/multi-unit recordings from human mesial temporal lobe. *Journal of Neural Engineering*. 11, 2, 026013.
21. **Jacobs, J.*** (2014). Hippocampal theta oscillations are slower in humans than in rodents: Implications for models of spatial navigation and memory. *Philosophical Transactions of the Royal Academy of Sciences B*. 369: 20130304.

20. Merzagora-Rodriguez, A., Coffey, T., Sperling, M., Sharan, A., & **Jacobs, J.*** (2014). Repeated stimuli elicit diminished high-gamma electrocorticographic responses. *NeuroImage*. 85, 844–852.
19. Miller, J., Neufang, M., Solway, A., Brandt, A., Hefft, S., Mader, I., Polyn, S., **Jacobs, J.**, Kahana, M.*, & Schulze-Bonhage, A.* (2013). Neural activity in human hippocampal formation reveals the spatial context of retrieved memories. *Science*, 342, 6142, 1111–1114.
18. **Jacobs, J.**, Weidemann, C., Burke, J., Miller, J., Wei, X., Solway, A., Sperling, M., Sharan, A., Fried, I., & Kahana, M.* (2013). Direct recordings of grid cells in human spatial navigation. *Nature Neuroscience*. 16(9), 1188–1190. **Featured on the journal cover.**
17. van Gerven, M., Maris, E., Sperling, M., Sharan, A., & **Jacobs, J.*** (2013). Decoding individual brain states with direct human brain recordings. *NeuroImage*. 70, 223–232.
16. Burke, J. F., Zaghoul, K. A., **Jacobs, J.**, Sperling, M. R., Sharan, A. D., & Kahana, M. J*. (2013). Synchronous and asynchronous theta and gamma activity during human verbal episodic memory formation. *The Journal of Neuroscience*. 33(1), 292–304.
15. **Jacobs, J.***, Lega, B. & Anderson, C. (2012). Explaining how brain stimulation can evoke memories. *Journal of Cognitive Neuroscience*. 24(3), 553–563.
14. **Jacobs, J.***, Miller, K., Edwards, E., & Voytek, B. (2011). Spurious report of high-frequency electrocorticographic oscillations. [Electronic response to Nonuniform High-Gamma (60–500 Hz) Power Changes Dissociate Cognitive Task and Anatomy in Human Cortex., Gaona et al.] *The Journal of Neuroscience*. Published online Feb. 28, 2011.
13. Lega, B., **Jacobs, J.**, & Kahana, M.J*. (2011). Human hippocampal theta oscillations and the formation of episodic memories, *Hippocampus*, 22(4), 748–761.
12. **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.
11. **Jacobs, J.*** & Kahana, M.J. (2010). Direct brain recordings fuel advances in cognitive electrophysiology. *Trends in Cognitive Sciences*. 14(4), 162–171.
10. **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.
9. **Jacobs, J.**, Manning, J.R., & Kahana, M.J. (2010). Response to Miller: “Broadband” vs. “high gamma” electrocorticographic signals. *The Journal of Neuroscience*. 30, online.
8. 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.
7. **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.
6. **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.
5. 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.
4. 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.
3. **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.

2. 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.
1. 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.

Preview/news Articles

2. Qasim, S. & **Jacobs, J.** (2016). Human hippocampal theta oscillations during movement without visual cues. *Neuron*, 89, 6, 1121–1123.
1. **Jacobs, J.** & Lee, S. A. (2016). Spatial Cognition: Grid cells support imagined navigation. *Current Biology*, 26, 7, R277–R279.

Note: * indicates senior or corresponding author.

Pending funding

- National Institutes of Mental Health, Brain Initiative. U01. Title: “Mapping Algorithmic State Space in the Human Brain”. 2/1/2021–1/31/2026. PI: Sheth, S. Allocation to Jacobs \$1,450,000.
- National Institutes of Mental Health, Brain Initiative. U19. Title: “Testing an Integrative Model of Episodic Memory” 6/1/2021–5/31/2026. Allocation to Jacobs: \$2,500,000.

Current funding as principal investigator

- National Institutes of Mental Health, 2R01-MH104606 (renewal). Title: “The Role of Place and Grid Cells in Human Spatial and Non Spatial Memory.” 9/1/2020–8/31/2025, \$3,520,228 total costs. PI: Jacobs.
- National Institute of Mental Health R21-MH117682. Title: “Brain stimulation for cognitive enhancement based on modulation of cortical traveling waves.” 9/2018–6/2021 (NCE). PI: Jacobs. \$440,000 total costs.
- National Science Foundation: Collaborative Research in Computational Neuroscience (CRCNS). Title: “USA-Germany Research Proposal: Probing the role of grid cells in human episodic memory.” 11/2017–10/2020. PI: Jacobs. \$811,502 total costs.
- National Science Foundation. Title: “CAREER: Characterizing mechanisms of navigation and memory using direct human brain recording and stimulation.” 9/2019–8/2024. PI: Jacobs. \$564,000 total costs.
- Neurtext Brain Research Institute. Title: “Neurtext Brain Research Institute Research Project.” 7/1/2018–11/30/2021. PI: Jacobs. \$475,000 total costs.
- Research Initiatives in Science & Engineering (RISE) fund, Columbia University. Title: “High-resolution measurements of cortical traveling waves for brain-computer interfacing and cognitive control.” PIs: Jacobs, J. & Gottlieb, J. (9/2020–8/2021). Total cost: \$80,000. Renewable for additional \$80,000 for 9/2021–8/2022.

Current funding as co-investigator

- National Institute of Health, BRAIN Initiative. U01-NS113198. Title: “Using Direct Brain Stimulation to Study Cognitive Electrophysiology”. 9/2019–8/2024. Subcontract to Jacobs for \$1,283,131 total costs.
- NIH Brain Initiative U03: Decoding resting state functional connectivity mapping using SCAPE microscopy (0.5 months salary support). PI: Hillman, E. Jacobs, coinvestigator. 9/2017–8/2022.

Completed funding

- National Institute of Mental Health R01-MH104606. Title: “Role of grid and place cells in human spatial navigation and memory.” 8/2015–5/31/2020. PI: Jacobs. \$2,664,846 total costs.
- DARPA Restoring Active Memory (RAM). Title: “Memory Enhancement with Modeling, Electrophysiology, and Stimulation (MEMES).” Cooperative Agreement N66001-14-2-4032. Subcontract from U. Penn. \$1,200,250. 7/2014–7/2019.

- National Institute of Mental Health R01-MH061975. Title: “Electrophysiology of human spatial navigation and memory.” Subcontract to Jacobs, coinvestigator. \$497,666.
- National Institute of Mental Health U01-NS098976: Title: “Dynamic Neural Mechanisms of Audiovisual Speech Perception”. PI: Schroeder. Jacobs, coinvestigator (1.5 months salary support). 9/2016–2/2020.
- NIH U01 Administrative Supplement: Developing Virtual Reality Software for Probing the Role of Space in Multisensory Perception. \$100,000 (direct costs).
- NIMH R01-MH104606-A3 *Administrative Supplement Program Providing Research Experiences for Physicians and Medical Students from Diverse Backgrounds*. Supplement to R01-MH104606. 9/2015–7/2016. \$72,619.
- Brain and Behavior Research Foundation (formerly NARSAD). New Investigator Award. \$60,000, 1/2013–12/2015.
- Drexel Human Cognition Enhancement Program. \$10,000, (11/2011–10/2012).
- NIH Neuroimaging training grant postdoctoral fellowship (1/2009–8/2010).
- 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).

Awards

- Faculty Early Career Development Program (CAREER), National Science Foundation (2019).
- Elected to the Memory Disorders Research Society (2019). (MDRS is an invitation-only professional society dedicated to the study of memory and memory disorders, see: <https://clm.utexas.edu/mdrs/>.)
- New Investigator Award, Brain and Behavior Research Foundation (NARSAD) (2013).
- Winegrad Award for best dissertation in Neuroscience at University of Pennsylvania (2009).
- NIH Predoctoral National Research Service Award (5/2008–12/2008).
- Westinghouse (Intel) Science Talent Search Finalist (1997).
- International Science and Engineering Fair: Naval Science Award (1997), Second Place in Social Science (1997).

Teaching

- 2020 (Fall), 2018 (Fall), 2016 (Fall), *Biostatistics for Engineers*, Columbia University (BMEN-E4110).
- 2020 (Spring), *Electrophysiology of Human Navigation and Memory*, Columbia University (BMEN-E4050).
- 2019 (Fall), 2019 (Spring), 2017 (Fall), *Computational Modeling of Physiological Systems*, Columbia University (BMEN-E6003).
- 2020 (Fall), 2018 (Fall), 2016 (Fall), *Biostatistics for Engineers*, Columbia University (BMEN-E4110).
- 2018 (Spring), 2017 (Spring), *Seminar in Human Memory and Navigation*, Columbia University (BMEN-E4050).
- 2011, 2012, 2013, & 2014 (Spring), Drexel University, *Principles in Neuroengineering* (BMES-478/BMES-711). Average rating: 4.9 out of 5.
- 2013 & 2014 (Winter), Drexel University, *Research Methods in Biomedical Engineering* (BMES-315/515). Average rating 4.5/10.
- 2012 (Winter), Drexel University, *Programming and Modelling for Biomedical Engineering* (BMES-202). Average rating: 4.6/5.

- 2009, 2010, 2011, & 2012. Director of the University of Pennsylvania's Undergraduate Summer Training Program in Computational Neuroscience (sponsored by NIH grant T90 DA 22763-01).

Current Mentoring

- Serra Favila (12/2019–present). Postdoctoral research fellow. Project title: “Oscillatory synchrony between hippocampus and cortex.” *National Institutes of Health F99/K00 award (\$294,192, 9/30/2019–9/29/2023)*.
- Shachar Maidenbaum, Ph.D. (3/2017–present). Postdoctoral research fellow. Project title: “Correspondence between fMRI and electrical activity underlying human spatial memory.” *National Institutes of Health, F32 Ruth L. Kirschstein National Research Service Award (\$123,800, 7/1/2019–6/30/2021)*.
- Salman Qasim (9/2015–present). Columbia University graduate student in Biomedical Engineering. Project title: “Phase precession with human theta oscillations and single-cell recordings.” *National Science Foundation Graduate Student Fellowship (9/1/2016–8/30/2019)*.
- Uma Mohan (1/2016–present). Columbia University graduate student in Biomedical Engineering. Project title: “Cross-frequency phase coupling in the human hippocampus.”
- Melina Tsitsiklis (9/2015–present). Columbia University graduate student in Neurobiology and Behavior. Jointly advised with Daphna Shohamy.
- Tamara Gedankien (8/2017–present). Columbia University graduate student in Biomedical Engineering.
- Erfan Zabeh (9/2019–present). Columbia University graduate student in Biomedical Engineering.

Past Mentoring

- Ida Momennejad, Ph.D. (May 2019–present). Postdoctoral research fellow. Project title: “Human place and grid cells during learning of predictive representations.” Current position: Research Scientist at Microsoft Research.
- Andrew Watrous, Ph.D. (6/2015–6/2018). Postdoctoral researcher. Current position: Assistant Professor at University of Texas, Austin.
- Jonathan Miller (Ph.D., 9/2011–6/2015; post-doctoral fellow: 7/2015–6/2019). Current status: Data analyst at Commonwealth Computer Research.
- Honghui Zhang. (Ph.D., 12/2010–5/2017; post-doctoral fellow, 6/2017–12/2019). Current status: Software Engineer at Amazon.
- Abhinav Goyal (5/17–6/18). Research assistant. Current status: MD/Ph.D. student at Mayo Clinic, Rochester, MN.
- Simon Khuvis, (1/1/16–3/2019). MD/PhD student, Northwell North Shore University Hospital.
- Tora Bonnevie (1/1/2016–12/31/2018). Current status, research fellow in the laboratory of Edvard and May-Britt Moser (Norwegian University of Science and Technology, Trondheim, Norway).
- Tom Coffey (6/2012–9/2015). Current status: Graduate student at Drexel University.
- Walter Hinds (9/2010–8/2012). Current status: Postdoc at Columbia University.
- Shady El Damaty (M.S., 9/2011–6/2013). Currently a Ph.D. student at Georgetown University.
- Hagai Lalazar (1/2016–5/2017). Postdoctoral researcher.

Selected invited Talks

2021: NYU Discussion on Ripple detection Methods (5/10/2021).

2021: Otto-von-Guericke University of Magdeburg, Germany (1/27/2021).

2020: Worcester Polytechnic Institute (12/7/2020), Baylor University College of Medicine (12/4/2020), Amazon.com Symposium on Alzheimer's Disease (8/27/2020), CNRS-Centre de Recherche Cerveau et Cognition, Toulouse, France (5/14/2020; cancelled due to pandemic), Bernstein Center for Computational Neuroscience (5/13/2020), Max Planck Institute for Empirical Aesthetics (April, 23 2020), Northwestern University (2/27/2020), Columbia University Engineering in Medicine Symposium (2/20/2020), Winter Conference on Neuroplasticity (2/14/2020).

2019: City College of New York Graduate Center (11/2019), Yale University (11/2019), Society for Neuroscience minisymposium (10/2019), Society for Psychophysiological Research (9/2019), Bernstein Conference on Computational Neuroscience (9/2019), NSF 15th CRCNS Investigator meeting (9/2019), Rutgers University (4/2019), University of Texas, Austin (2/2019), City College of New York (1/2019), Princeton Neuroscience Institute (1/2019), Columbia Division on Substance Use Disorders (1/2019).

2018: University of Freiburg, Germany (10/2018), Boston University (9/2018), University of Connecticut (9/2018), iNAV (Interdisciplinary Navigation Symposium), Cognitive Neuroscience Society Annual Meeting (3/2018), Computational and Systems Neuroscience (COSYNE) workshop (3/2018).

2017: International Conference for Cognitive Neuroscience (8/2017), Hippocampus Meeting (6/2017), Statistical Analysis of Neural Data 8 (SAND8) (6/2017).

2016: Third Human Single-Neuron Recordings Conference (10/2016), iNAV (6/2016), Columbia CTNI (6/2016), Grossman Center for the Statistics of the Mind (5/2016), NAVIGO (3/2016).

2015: Columbia Department of Psychology (10/2015). Center for Neural Engineering and Computation, Columbia University (10/2015), NeuroTheory Center (6/2015), National Academy of Engineering, Symposium on Engineering in Medicine (4/2015), Columbia Neurosurgery Department Grand Rounds (2/2015).

2014: Single-neuron studies of the human brain (11/2014), NeuroFutures Summit (6/2014), Harvard University's Department of Psychology (1/2014).

2013: Fifth International Workshop on Advances in Electroencephalography (11/2013), Brandeis University (9/2013), Space in the Brain, Royal Society, UK (5/2013), Massachusetts Institute of Technology, Department of Brain and Cognitive Science (1/2013).

2012: U. Penn Center for Cognitive Neuroscience (9/2012), Drexel Chronobiology and Sleep Symposium (9/2012).

2011: University of Wisconsin, Milwaukee (12/2011), University of Pennsylvania Department of Psychiatry (10/2011), Montreal Neurological Institute (6/2011), Drexel Human Cognition Enhancement Program (5/2011), Drexel University Neurobiology Department (5/2011), Princeton University Department of Psychology (3/2011), Hahnemann Hospital (3/2011).

Society memberships

- Society for Neuroscience (2003–present).
- Cognitive Neuroscience Society (2004–present).
- Psychonomic Society (2005–present).
- Memory Disorders Research Society (2019–present).

Reviewing for USA Federal Funding Agencies

- National Institutes of Health, Learning and Memory (LAM) Study Section (October, 2020).
- National Institutes of Health, Molecular, Cellular, and Behavior Neuroscience, F30, F31, & F32 Fellowship Study Section, ZRG1 F02C-A(20) (July, 2020).
- National Institutes of Health, Cognition and Perception (CP) Study Section (June, 2020).
- National Institutes of Health, BRAIN Initiative, U19 study section, ZNS1 SRB-N-21 (March, 2020).

- National Science Foundation, ad-hoc reviewer (November, 2019).
- National Science Foundation, invited review panelist (May, 2019).
- National Institutes of Health, BRAIN Initiative, U19 review panel, ZNS1 SRB-N-18 (March, 2019).
- Air Force Office of Scientific Research, Cognitive & Computational Neuroscience program (February, 2019).
- National Institutes of Health, Cognition and Perception study section (October, 2018).
- National Institutes of Health, BRAIN Initiative, U19 review panel, ZNS1 SRB-N-16 (April, 2018).
- National Science Foundation, invited review panelist (April, 2018).
- National Science Foundation, invited review panelist (October, 2017).
- National Institutes of Health, Special Emphasis Panel ZRG1 IFCN-B-55 (June, 2017).
- National Science Foundation, ad-hoc reviewer (March, 2017).
- National Institutes of Health: Special Emphasis Panel ZRG1 IFCN-T-55 (October, 2016).

Reviewing for Other Organizations

- Columbia University internal Competition for Johnson & Johnson WiSTEM2D Scholars Program (September, 2020).
- Columbia University Department of Psychiatry, Smither Pilot Program. (January 2020).
- Columbia University Research Initiatives in Science & Engineering. (November, 2020; March, 2019; February, 2018; October, 2016).
- Czech Science Foundation, Department of Medical and Biological Sciences (June, 2018).
- Wellcome Trust (February, 2018).
- Grant reviewer for the Irving Institute for Clinical and Translational Research (April, 2017).
- European Union Grid-Map research program, on-site reviewer, Trondheim, Norway (November 30, 2015).
- European Union Grid-Map research program, on-site reviewer, Brussels, (March 26–30, 2014).
- Poland National Science Center (March, 2014).
- Army Research Office (June, 2010).

Academic Service at Columbia University

- Founding organizer of the Columbia Hippocampus Club (a University-wide discussion group for researchers studying the hippocampus, funded by the MBBI). (2018–present).
- Member of Columbia Department of Biomedical Engineering (DBME) Graduate Student Evaluation Committee (2015–present).
- Department of Biomedical Engineering representative on the Columbia Translational Neuroscience Initiative (2015–present).
- Member of Department of Biomedical Engineering Hiring Committee in Magnetic Resonance Imaging (2015–2016 academic year).

General Academic Service

- Member of the organizing board of iNav, the Interdisciplinary Navigation Symposium (2019–present).

- Editorial board member: *Royal Society: Open Science*. 2015–2017.
- Mentor for underrepresented medical student Omar Elfanagely. (August 2015–May 2016.)
- Peer reviewing (roughly two reviews per month, see <https://publons.com/a/1178573>): *Cell*, *Current Biology*, *Human Brain Mapping*, *NeuroImage*, *Journal of Neuroscience*, *Science*, *Computational and Systems Neuroscience* (COSYNE), *Cerebral Cortex*, *Neuron*, *Journal of Cognitive Neuroscience*, *Public Library of Science: Computational Biology*, *Hippocampus*, *MIT Press*, *Neuroscience*, *Epilepsia*, *Army Research Office*, *Nature Neuroscience*, *Journal of Neurophysiology*, *European Union Grant Office*, *Psychological Reports*, *Journal of Neuroscience Methods*, *Nature Neuroscience*, *Royal Society: Open Science*, *Poland National Science Center*, *Wellcome Trust*, *Nature Communications*, *Nature Human Behavior*, *Proceedings of the National Academy of Sciences*, *Cell Research*, *eLife*, *Current Opinion in Behavioral Sciences*, *eNeuro*.

Collaborators

- Jacqueline Gottlieb (Neuroscience, Columbia University).
- Mariam Aly (Psychology, Columbia University).
- Sameer Sheth, Catherine Schevon, & Charles Schroeder (Epilepsy Center, Columbia University).
- Itzhak Fried (Neurosurgery, University of California, Los Angeles).
- Michael Sperling, Joseph Tracy, Aswhini Sharan, Mijail Serruya (Neurology & Neurosurgery, Thomas Jefferson University).
- Brian Litt, Gordon Baltuch, Tim Lucas, & Michael Kahana (University of Pennsylvania).
- Barbara Jobst (Neurology, Dartmouth–Hitchcock Medical Center).
- Gregory Worrell (Neurology, Mayo Clinic).
- Bradley Lega (Neurosurgery, University of Texas, Southwestern Medical Center).
- Robert Gross (Neurosurgery, Emory University).

Media coverage (selected)

- Press related to outreach regarding scientific integrity.
 - *The Atlantic*, “When evidence says no but doctors say yes,” February, 2017. <https://www.theatlantic.com/health/archive/2017/02/when-evidence-says-no-but-doctors-say-yes/517368/>
- Press related to “Phase Precession in the human hippocampus and entorhinal cortex” in *Cell* (2021):
 - *Wired*, “A New Way to Understand the Brain’s Intricate Rhythm,” June, 2021. <https://cosmosmagazine.com/biology/the-tour-guide-in-our-brain>
- Press related to my paper “Memory retrieval modulates spatial tuning of single neurons in the human entorhinal cortex in *Nature Neuroscience* (2019):
 - *Medical Science News*, “Study sheds new light on the brain’s spatial map,” November, 2019. <https://www.news-medical.net/news/20191111/Study-sheds-new-light-on-the-brains-spatial-map.aspx>
 - *Science Daily*, “Specific neurons that map memories now identified in the human brain,” November, 2019. <https://www.sciencedaily.com/releases/2019/11/191112095740.htm>
 - *Cosmos*, “The tour guide in our brain: Researchers find specific neurons that map memories,” November, 2019. <https://cosmosmagazine.com/biology/the-tour-guide-in-our-brain>
- Press related to my paper “Theta and alpha oscillations are traveling waves in the human neocortex” in *Neuron* (2018).

- *Scientific American*: Makin, S. “Traveling brain waves may be critical for cognition.” June 28, 2018. <https://www.scientificamerican.com/article/traveling-brain-waves-may-be-critical-for-cognition/>
- Press related to my paper “Direct electrical stimulation of human entorhinal cortex impairs memory” in *Neuron* (2017).
 - *Nature News & Views*: Young N. & Deisseroth, K., “Cognitive neuroscience: In search of lost time” (2017). 542, 173—174.
 - *Wall Street Journal*, “Deep Brain Stimulation Fails to Improve Memory in New Study,” December 13, 2016. <https://www.wsj.com/articles/deep-brain-stimulation-fails-to-improve-memory-in-new-study-1481130000>.
 - *Time*, “Why Scientists are Still Flummoxed by Alzheimer’s,” December 7, 2016. <http://time.com/4592564/why-scientists-are-still-flummoxed-by-alzheimers/>.
 - *Neurology Today*, “Deep Brain Stimulation Impairs Memory, Researchers Report,” January 19, 2017. <http://mobile.journals.lww.com/neurotodayonline/Pages/articleviewer.aspx?year=2017&issue=01190&article=00003&type=Fulltext>
- Selected press related to my paper “Direct recordings of grid cells in human spatial navigation” (2013) in *Nature Neuroscience*:
 - Whalley, K. (2013), Humans are on the grid. *Nature Reviews Neuroscience*, 14, 667.
 - Navigational Cells Located in Human Brains. *New York Times*. August 4, 2013. <http://www.nytimes.com/2013/08/06/science/navigational-cell-systems-located-in-human-brains.html>
 - Grid Cells help rats, humans with navigation, researchers say. *Fox News*. August 5, 2013. <http://www.foxnews.com/science/2013/08/05/grid-cells-help-humans-navigate.html>
 - Sense of Direction comes from Grid Cells in Brain, Researchers Find. *Huffington Post*, August 5, 2013. http://www.huffingtonpost.com/2013/08/05/sense-of-direction-grid-cells-brain_n_3708972.html.
 - *Live Science*. Human Brains Have Internal GPS. Tanya Lewis, August 8, 2013, <http://www.livescience.com/38772-human-gps-neurons-found.html>

Last updated: June 15, 2021