

Jan Kubanek

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Positions

University of Utah
Assistant Professor in Biomedical Engineering 2018

Stanford University School of Medicine
Postdoctoral research in Neuromodulation

Washington University School of Medicine
Ph.D. in Neuroscience 2013

Active Research Support

- **NIH R01, National Institute of Neurological Disorders and Stroke**
\$2,944,696, Co-I, 2021-2026
- **NIH R00, National Institute of Neurological Disorders and Stroke**
\$744,090, PI, 2019-2022
- **Focused Ultrasound Foundation**
\$100,000, PI, 2021-2023
- **College of Engineering Seed Grant**
\$38,000, PI, 2022-2023

Patents

- **U-6973 Diadem: Device for noninvasive, patient-specific, and controlled therapies of the brain.** *Attorney Docket No. 026389-9294-US01.*
- **U-6890 Targeted noninvasive drug delivery and multimodal imaging agents.** *Provisional Patent 63/283,110.*

Open-source Hardware and Software

- **Remus: System for Remote Deep Brain Interventions**
www.onetarget.us/tools
- **NeuralAct: A tool to visualize cortical activity on a three-dimensional model of brain surface**
www.onetarget.us/software

Honors

- Nomination for the Moore Inventor Fellowship. Role: PI. 2021.
- Best Teacher in Biomedical Engineering (College of Engineering Dean's Office). Fall 2020, University of Utah.
- NIH R00 Award. 2019-2022.
- Nomination for the Moore Inventor Fellowship. Role: PI. 2019.
- NIH K99 Award. 2016-2018.
- Stanford University School of Medicine Dean's Postdoctoral Fellowship. 2015-2016.
- Granted U.S. permanent residency as a scientist with exceptional ability. 2015.
- McDonnell Center for Systems Neuroscience Pilot Grant. 2013-2014.
- Merlie Fellowship for advanced training in neuroscience. Washington University. 2010.
- Ambassadorial Scholar of the Czech Republic in the United States. Rotary Foundation. 2007-2008.
- Dean's Award. Czech Technical University in Prague. 2007.
- Hlávka Scholarship (academic results). Josef & Marie Hlávka Foundation, Prague. 2005 and 2006.

Media Coverage

- **Ultrasonic neurostimulation article communicated by 25 media outlets**
scienceadvances.altmetric.com/details/82416884/news
- **Society for Neuroscience Press Conference ultrasonic neurostimulation talk communicated by Scientific American**
scientificamerican.com/article/ultrasound-could-offer-noninvasive-treatment-for-parkinson-s-and-depression

Published Peer-reviewed Articles (i-10-index: 17; 1689 citations)

20. Riis T., Webb T., **Kubanek J.** Acoustic properties across the human skull. *Ultrasonics*. 119 (2022).
19. Riis T., **Kubanek J.** Effective Ultrasonic Stimulation in Human Peripheral Nervous System. *IEEE Transactions on Biomedical Engineering*. 3085170, (2021).
18. **Kubanek J.**, Brown J., Ye P., Butts Pauly K., Moore T., Newsome W. Remote, brain-region-specific control of choice behavior in primates. *Science Advances*. 6(21), eaaz4193 (2020).
17. Gaur P., Casey K., **Kubanek J.**, Li N., Mohammadjavadi M., Saenz Y., Glover G.H., Bouley D.M., and Butts-Pauly K. Histologic safety of transcranial focused ultrasound neuromodulation and magnetic resonance acoustic radiation force imaging in rhesus macaques and sheep. *Brain Stimulation*. 13(3), 804-814 (2020).
16. **Kubanek J.**, Shukla P., Das A., Baccus S., Goodman M. Ultrasound elicits behavioral responses through mechanical effects on neurons and ion channels in a simple nervous system. *The Journal of Neuroscience*, 1458-17 (2018).

15. **Kubaneck J.** Neuromodulation with transcranial focused ultrasound. *Neurosurgical Focus* 44 (2018).
14. **Kubaneck J.** Optimal decision-making and matching are tied through diminishing returns. *PNAS*, doi:10.1073/pnas.1703440114 (2017).
13. **Kubaneck J.**, Shi J., Marsh J., Chen D., Deng C., Cui J. Ultrasound modulates ion channel currents. *Scientific Reports* 6 (2016).
12. **Kubaneck J.**, Li J., Snyder L.H. Motor role of parietal cortex in a monkey model of hemispatial neglect. *PNAS*. 112, E2067-72 (2015).
11. **Kubaneck J.**, Snyder L.H. Reward-based Decision Signals in Parietal Cortex Are Partially Embodied. *The Journal of Neuroscience*, 35(12):4869–81 (2015).
10. **Kubaneck J.**, Snyder L.H. Reward size governs repeat-switch decisions and strongly modulates the activity of neurons in parietal cortex. *Cerebral Cortex* (2015).
9. **Kubaneck J.**, Schalk G. NeuralAct: A tool to visualize electrocorticographic (ECoG) activity on a three-dimensional model of the cortex. *Neuroinformatics*, 13, 167-74 (2015).
8. **Kubaneck J.**, Snyder L.H, Abrams R.A. Rewards and punishments act as distinct factors in guiding behavior. *Cognition*, 139, 154–167 (2015).
7. **Kubaneck J.**, Snyder L.H. Matching Behavior as a Tradeoff Between Reward Maximization and Demands on Neural Computation. *F1000Research* (2015).
6. **Kubaneck J.**, Hill J., Snyder L.H, Schalk G. Cortical alpha activity reflects the degree of confidence in committing to an action. *Frontiers in Neuroscience* 9, 243 (2015).
5. **Kubaneck J.**, Snyder L.H., Brunton B.W., Brody C., Schalk G. A low frequency oscillatory neural signal in humans encodes a developing decision variable. *NeuroImage*, 83, 795-808 (2013).
4. **Kubaneck J.**, Wang C., Snyder L.H. Neuronal responses to target onset in oculomotor and somatomotor parietal circuits differ markedly in a choice task. *Journal of Neurophysiology* 110.10, 2247-2256 (2013).
3. **Kubaneck J.**, Brunner P., Gunduz A., Poeppel D., Schalk G. The Tracking of Speech Envelope in the Human Cortex. *PLOS ONE* 8, no. 1 (2013).
2. **Kubaneck J.**, Miller K.J., Ojemann J.G., Wolpaw J.R., Schalk G. Decoding flexion of individual fingers using electrocorticographic signals in humans. *Journal of Neural Engineering*, vol. 6 pp. 66001 (2009).
1. Schalk G., **Kubaneck J.**, Miller K.J., Anderson N., Leuthardt E.C., Ojemann J.G., Limbrick D., Moran D., Gerhardt L.A., Wolpaw J.R. Decoding Two-Dimensional Movement Trajectories Using Electrocorticographic Signals in Humans. *Journal of Neural Engineering*, 4, 264-275 (2007).

Academic service

- NIH Study Section ZNS1 SRB-M, BRAIN Initiative: Biology and Biophysics of Neural Stimulation and Recording Technologies
- Associate Editor (Frontiers; specialization in Neuromodulatory Interventions)
- Ad-hoc reviewer, Focused Ultrasound Foundation

- Ad-hoc reviewer for many journals (1-2 reviews per month)
- University of Utah Scholarship Committee
- University of Utah Qualifying Exam Committee
- University of Utah Faculty Recruitment Committee

Mentoring and Teaching

University of Utah

Lecturer in BME 4101 - Biosystems

Sep 2022–Nov 2022

Analysis

In this course, I co-taught students how to analyze and design systems for various biomedical applications. My part of the course received an average 5.51/6.00 evaluation and 5.32/6.00 for the instructor, of 37 student opinions.

University of Utah

Lecturer in BME 6470 - Neural

Spring 2021–Spring 2022

Engineering Research Group

In this seminar, I help neural engineering students to crystalize their PhD projects, and schedule external speakers on topics related to neural engineering.

University of Utah

Lecturer in BME 5480 - Diagnostic

Aug 2019–Dec 2019, Aug 2020–Dec 2020

and Therapeutic Ultrasound

In this course, I taught students the principles behind and the applications of current diagnostic and therapeutic uses of ultrasound. In 2020, the course received an average 5.79/6.00 evaluation and 5.89/6.00 for the instructor, of 19 student opinions.

University of Utah

Mentor

Oct 2018–present

I am currently advising 1 postdoc, 3 PhD students, and 1 undergraduate student.

Languages

- Human: English (fluent), German (fluent), Spanish (fluent), French (intermediate), Czech (native)
- Machine: Matlab, C/C++, Java, L^AT_EX