# Ankit N. Khambhati

Assistant Professional Researcher
*Department of Neurosurgery*
*Weill Institute for Neurosciences*
*University of California, San Francisco*
*1651 4th Street, 671C*
*San Francisco, CA 94158*

609-240-1889 | ankit.khambhati@ucsf.edu | www.ankhambhati.com | akhambhati | @ankhambhati | Google Scholar

## Education

**School of Engineering & Applied Sciences, University of Pennsylvania** — *Philadelphia, PA, USA*
Ph.D. in Bioengineering — *2011 - 2015*
- Advisors: Brian Litt, M.D. and Danielle S. Bassett, Ph.D.
- Committee: Timothy H. Lucas, M.D., Ph.D. and Daniel Lee, Ph.D.
- *Thesis: Mapping Functional Architecture in Neocortical Epileptic Networks*

**School of Engineering & Applied Sciences, University of Pennsylvania** — *Philadelphia, PA, USA*
M.S.E. in Bioengineering — *2010 - 2011*
- Research Advisor: Brian Litt, M.D.
- *Thesis: NeuralView: A Novel Translational Tool for Visualizing Patient EEG Spatiotemporally in the Epilepsy Monitoring Unit*

**Carnegie Institute of Technology, Carnegie Mellon University** — *Pittsburgh, PA, USA*
B.S. in Electrical and Computer Engineering with Minors in Computational Neuroscience & Chemistry — *2005 - 2009*
- Research Advisor: Tai Sing Lee, Ph.D.

## Academic & Professional Experience

**Department of Neurological Surgery, University of California, San Francisco** — *San Francisco, CA, USA*
Postdoctoral Scholar — *2018 - Present*
- Research Advisor: Edward F. Chang, M.D.
- *Biomarker discovery and closed-loop neurostimulation for treatment-resistant depression*
- *Mechanisms of brain network neuromodulation through chronic direct electrical stimulation*

**School of Engineering & Applied Sciences, University of Pennsylvania** — *Philadelphia, PA, USA*
Postdoctoral Scholar — *2016 - 2018*
- Research Advisor: Danielle S. Bassett, Ph.D.
- *Unsupervised learning of dynamic graph topologies underlying brain network reorganization*

**Neuromodulation, Medtronic plc** — *Minneapolis, MN, USA*
Summer Associate, Neural Engineering — *Summer 2012*
- Manager: Timothy Denison, Ph.D.
- *Translational platform for prototyping closed-loop neuromodulation systems*

**Center for Neural Science, New York University** — *New York, NY, USA*
Junior Research Scientist — *2009 - 2010*
- Research Advisor: Robert Shapley, Ph.D.
- *Laminar electrophysiology of visually evoked activity in macaque primary visual cortex*

**Center for Neural Basis of Cognition, Carnegie Mellon University** — *Pittsburgh, PA, USA*
Undergraduate Research Fellow — *2006 - 2009*
- Research Advisor: Tai Sing Lee, Ph.D.
- *Computational models of contrast and brightness in primary visual cortex*

## Honors & Awards

2019 **Taking Flight Award**, Citizens United for Research in Epilepsy
2016 **Solomon R. Pollack Award for Cutting-Edge Graduate Research**, Dept. of Bioeng., Univ. of Penn.
2015 **International Workshop on Seizure Prediction: Travel Award**, Melbourne, Australia
2015 **Founders Award for Contributions to Scientific Community**, Harnwell College House, Univ. of Penn.
2007 **NIH Undergraduate Research Fellowship in Neural Computation**, Carnegie Mellon Univ.
2006 **NSF Research Experience for Undergraduates**, Carnegie Mellon Univ.

# Funding

**Responsive Neurostimulation for Treatment Resistant Depression**

NIH UH3 NS123310 *2023 - 2028*

Role: Co-I (Katherine Scangos & Andrew Krystal, Co-PIs)

**Biomarkers to Predict Outcome from Responsive Brain Stimulation for Epilepsy**

NIH R61 NS125568-01 *2023 - 2028*

Role: Co-I (Vikram Rao, Dan Freedman, Kathryn Davis, Co-PIs)

**Deciphering Principles of Network Dynamics Underlying Depression Symptom Severity from Multi-Day Intracranial Recordings in Patients with Major Depression**

NIH R21 MH124759-02 *2021 - 2023*

Role: Co-I (Andrew Krystal, PI)

**Stochastic, Multi-Electrode Stimulation to Probe and Perturb Abnormal Synchronization in the Human Epileptic Network**

Taking Flight Award, Citizens United for Research in Epilepsy *2020 - 2021*

Role: PI (Edward F. Chang, Mentor)

# Publications

## In Preparation

**Khambhati, A. N.**, Astudillo Maya, D. A., Stapper, N., Henderson, C., Sellers, K. K., Fan, J. M., … Krystal, A. D. (2023). Chronic morphological plasticity of brain response to direct single pulse electrical stimulation tracks depression severity in indivudals undergoing responsive neurostimulation. *In Preparation*.

**Khambhati, A. N.**, Sellers, K. K., Fan, J. M., Astudillo Maya, D. A., Stapper, N., Kunwar, E., … Chang, E. F. (2023). Adaptive tuning of brain activity biomarkers of treatment-resistant depression for effective and chronic closed-loop electrical stimulation treatment. *In Preparation*.

## 2023

Astudillo Maya, D. A., Sellers, K. K., Stapper, N., **Khambhati, A. N.**, Henderson, C., Fan, J. M., … Krystal, A. D. (2023). Identification of neural biomarkers of major depressive disorder symptom severity using computerized linguistic analysis. *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*.

Fan, J., Lee, A. M., Sellers, K. K., Woodworth, C., Makhoul, G. S., Liu, T. X., … Krystal, A. D. (2023). Intracranial electrical stimulation of corticolimbic sites modulates arousal in humans. *Brain Stimulation*, *In Press*.

Fan, J. M., **Khambhati, A. N.**, Sellers, K. K., Stapper, N., Astudillo Maya, D. A., Kunwar, E., … Krystal, A. D. (2023). Epileptiform discharges triggered with direct electrical stimulation for treatment-resistant depression: Factors that modulate risk and treatment considerations. *Brain Stimulation*, *16*(2), 462–465.

Sellers, K. K., Cohen, J., **Khambhati, A. N.**, Fan, J. M., Lee, A. M., Chang, E. F., & Krystal, A. D. (2023). Closed-loop neurostimulation for the treatment of psychiatric disorders. *Neuropsychopharmacology*.

Sellers, K. K., **Khambhati, A. N.**, Stapper, N., Fan, J. M., Rao, V. R., Scangos, K. W., … Krystal, A. D. (2023). Closed-loop neurostimulation for biomarker-driven, personalized treatment of major depressive disorder. *Journal of Visualized Experiments*.

Sellers, K. K., Stapper, N., Astudillo Maya, D. A., Henderson, C., **Khambhati, A. N.**, Fan, J. M., … Krystal, A. D. (2023). Changes in intracranial neurophysiology associated with acute COVID-19 infection. *Clinical Neurophysiology*, *148*, 29–31.

## 2022

Bijanzadeh, M., **Khambhati, A. N.**, Desai, M., Wallace, D. L., Shafi, A., Dawes, H. E., … Chang, E. F. (2022, June). Decoding naturalistic affective behaviour from spectro-spatial features in multiday human iEEG. *Nature Human Behaviour*, *6*(6), 823–836. Retrieved 2022-08-19, from `https://www.nature.com/articles/s41562-022-01310-0` doi: 10.1038/s41562-022-01310-0

Scheid, B. H., Bernabei, J. M., **Khambhati, A. N.**, Mouchtaris, S., Jeschke, J., Bassett, D. S., … Litt, B. (2022, March). Intracranial electroencephalographic biomarker predicts effective responsive neurostimulation for epilepsy

prior to treatment. *Epilepsia*, *63*(3), 652–662. Retrieved 2022-08-19, from https://onlinelibrary.wiley.com/doi/10.1111/epi.17163 doi: 10.1111/epi.17163

## 2021

Bijanzadeh, M., **Khambhati, A. N.**, Desai, M., Wallace, D. L., Shafi, A., Dawes, H. E., … Chang, E. F. (2021). Decoding naturalistic affective behavior from spectro-spatial features in multiday human iEEG. *In Press: Nature Human Behavior*.

Chiang, S., **Khambhati, A. N.**, Wang, E. T., Vannucci, M., Chang, E. F., & Rao, V. R. (2021, March). Evidence of state-dependence in the effectiveness of responsive neurostimulation for seizure modulation. *Brain Stimulation*, *14*(2), 366–375. Retrieved 2021-03-03, from https://linkinghub.elsevier.com/retrieve/pii/S1935861X21000280 doi: 10.1016/j.brs.2021.01.023

**Khambhati, A. N.**, Shafi, A., Rao, V. R., & Chang, E. F. (2021, August). Long-term brain network reorganization predicts responsive neurostimulation outcomes for focal epilepsy. *Science Translational Medicine*, *13*(608), eabf6588. Retrieved 2021-08-27, from https://stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.abf6588 doi: 10.1126/scitranslmed.abf6588

Scangos, K. W., **Khambhati, A. N.**, Daly, P. M., Makhoul, G. S., Sugrue, L. P., Zamanian, H., … Chang, E. F. (2021, October). Closed-loop neuromodulation in an individual with treatment-resistant depression. *Nature Medicine*, *27*(10), 1696–1700. Retrieved 2021-11-16, from https://www.nature.com/articles/s41591-021-01480-w doi: 10.1038/s41591-021-01480-w

Scangos, K. W., **Khambhati, A. N.**, Daly, P. M., Owen, L. W., Manning, J. R., Ambrose, J. B., … Chang, E. F. (2021, October). Distributed Subnetworks of Depression Defined by Direct Intracranial Neurophysiology. *Frontiers in Human Neuroscience*, *15*, 746499. Retrieved 2021-11-30, from https://www.frontiersin.org/articles/10.3389/fnhum.2021.746499/full doi: 10.3389/fnhum.2021.746499

Silva, A. B., **Khambhati, A. N.**, Speidel, B. A., Chang, E. F., & Rao, V. R. (2021). Effects of anterior thalamic nuclei stimulation on hippocampal activity: chronic recording in a patient with drug-resistant focal epilepsy. *Epilepsy & Behavior Reports*.

## 2020

Andrews, J. P., Ammanuel, S., Kleen, J., **Khambhati, A. N.**, Knowlton, R., & Chang, E. F. (2020). Early seizure spread and epilepsy surgery: A systematic review. *Epilepsia*, *00*.

Ashourvan, A., Pequito, S., **Khambhati, A. N.**, Mikhail, F., Baldassano, S% , Davis, K. A., … Bassett, D. S. (2020, March). Model-based design for seizure control by stimulation. *Journal of Neural Engineering*, *17*(2), 026009. Retrieved 2020-06-24, from https://iopscience.iop.org/article/10.1088/1741-2552/ab7a4e doi: 10.1088/1741-2552/ab7a4e

Kao, C.-H., **Khambhati, A. N.**, Bassett, D. S., Nassar, M. R., McGuire, J. T., Gold, J. I., & Kable, J. W. (2020, December). Functional brain network reconfiguration during learning in a dynamic environment. *Nature Communications*, *11*(1), 1682. Retrieved 2020-04-07, from http://www.nature.com/articles/s41467-020-15442-2 doi: 10.1038/s41467-020-15442-2

## 2019

**Khambhati, A. N.**, Kahn, A. E., Costantini, J., Ezzyat, Y., Solomon, E. A., Gross, R. E., … Bassett, D. S. (2019). Functional control of electrophysiological network architecture using direct, single-node neurostimulation in humans. *Network Neuroscience*, 1–30. Retrieved from https://www.biorxiv.org/content/10.1101/292748v1 doi: 10.1101/292748

Kini, L. G., Bernabei, J. M., Mikhail, F., Hadar, P., Shah, P., **Khambhati, A. N.**, … Litt, B. (2019). Virtual resection predicts surgical outcome for drug resistant epilepsy. *Brain: a journal of neurology*, 1–14.

Stacey, W., Kramer, M., Gunnarsdottir, K., Gonzalez-martinez, J., Zaghloul, K., Inati, S., … Staba, R. (2019). Emerging roles of network analysis for epilepsy. *Epilepsy Research*, *159*(October 2019), 106255–106255. Retrieved from https://doi.org/10.1016/j.eplepsyres.2019.106255 doi: 10.1016/j.eplepsyres.2019.106255

Stiso, J., **Khambhati, A. N.**, Menara, T., Kahn, A. E., Stein, J. M., Das, S. R., … Bassett, D. S. (2019). White Matter Network Architecture Guides Direct Electrical Stimulation through Optimal State Transitions. *Cell Reports*,

*28*(10), 2554–2566.e7. Retrieved from https://doi.org/10.1016/j.celrep.2019.08.008 doi: 10.1016/j.celrep.2019.08.008

## 2018

Corsi, M.-C., Chavez, M., Schwartz, D., Hugueville, L., **Khambhati, A. N.**, Bassett, D. S., & Fallani, F. D. V. (2018). Integrating EEG and MEG signals to improve motor imagery classification in brain-computer interfaces. *In Press: International Journal of Neural Systems*, 1–13. Retrieved from http://arxiv.org/abs/1711.07258

**Khambhati, A. N.**, Mattar, M. G., & Bassett, D. S. (2018). Beyond modularity: Fine-scale mechanisms and rules for brain network reconfiguration. *NeuroImage*, *166*, 385–399.

**Khambhati, A. N.**, Medaglia, J. D., Karuza, E. A., Thompson-Schill, S. L., & Bassett, D. S. (2018). Subgraphs of functional brain networks identify dynamical constraints of cognitive control. *PLoS Computational Biology*, *14*(7), 1–33. doi: 10.1371/journal.pcbi.1006234

**Khambhati, A. N.**, Sizemore, A. E., Betzel, R. F., & Bassett, D. S. (2018, October). Modeling and interpreting mesoscale network dynamics. *NeuroImage*, *180*, 337–349. Retrieved 2020-02-20, from https://linkinghub.elsevier.com/retrieve/pii/S1053811917305001 doi: 10.1016/j.neuroimage.2017.06.029

Tomlinson, S. B., **Khambhati, A. N.**, Bermudez, C., Kamens, R. M., Heuer, G. G., Porter, B. E., & Marsh, E. D. (2018). Alterations of network synchrony after epileptic seizures: an analysis of post-ictal intracranial recordings in pediatric epilepsy patients. *Epilepsy research*.

## 2017

Baldassano, S., Brinkmann, B., Ung, H., Blevins, T., Conrad, E., Leyde, K., … Litt, B. (2017). Crowdsourcing Seizure Detection: Algorithm Development and Validation on Human Implanted Device Recordings. *Brain: a journal of neurology*, *140*(6), 1680–1691.

Bassett, D. S., & **Khambhati, A. N.** (2017). A network engineering perspective on probing and perturbing cognition with neurofeedback. *Annals of the New York Academy of Sciences*, *1396*(The Year in Cognitive Neuroscience), 126–143. doi: 10.1111/nyas.13338

Bassett, D. S., **Khambhati, A. N.**, & Grafton, S. T. (2017). Emerging Frontiers of Neuroengineering: A Network Science of Brain Connectivity. *Annual Reviews of Biomedical Engineering*, *19*, 327–352.

Chai, L. R., **Khambhati, A. N.**, Ciric, R., Moore, T. M., Gur, R. C., Gur, R. E., … Bassett, D. S. (2017). Evolution of brain network dynamics in neurodevelopment. *Network Neuroscience*, *1*(1), 14–30. doi: 10.1162/netn

**Khambhati, A. N.**, Bassett, D. S., Oommen, B. S., Chen, S., H., Lucas, T. H., Davis, K. A., & Litt, B. (2017). Recurring functional interactions predict network architecture of interictal and ictal states in neocortical epilepsy. *eNeuro*, *4*(1). doi: 10.1523/ENEURO.0091-16.2017

## 2016

**Khambhati, A. N.**, & Bassett, D. S. (2016). A Powerful DREADD: Revealing Structural Drivers of Functional Dynamics. *Neuron*, *91*(2), 213–215. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0896627316303622 doi: 10.1016/j.neuron.2016.07.011

**Khambhati, A. N.**, Davis, K. A., Lucas, T. H., Litt, B., & Bassett, D. S. (2016). Virtual Cortical Resection Reveals Push-Pull Network Control Preceding Seizure Evolution. *Neuron*, *91*(5), 1170–1182. Retrieved from http://dx.doi.org/10.1016/j.neuron.2016.07.039 doi: 10.1016/j.neuron.2016.07.039

## 2015

**Khambhati, A. N.**, Davis, K. A., Oommen, B. S., Chen, S. H., Lucas, T. H., Litt, B., & Bassett, D. S. (2015, December). Dynamic Network Drivers of Seizure Generation, Propagation and Termination in Human Neocortical Epilepsy. *PLoS Computational Biology*, *11*(12), e1004608–e1004608. Retrieved from http://dx.plos.org/10.1371/journal.pcbi.1004608 doi: 10.1371/journal.pcbi.1004608

### 2013

Afshar, P., **Khambhati, A. N.**, Stanslaski, S., Carlson, D., Jensen, R., Linde, D., … Denison, T. (2013). A translational platform for prototyping closed-loop neuromodulation systems. *Frontiers in Neural Circuits*, *6*, 1–15. Retrieved from http://journal.frontiersin.org/Journal/10.3389/fncir.2012.00117/full doi: 10.3389/fncir.2012.00117

### 2012

Yan, X., **Khambhati, A. N.**, Liu, L., & Lee, T. S. (2012, September). Neural dynamics of image representation in the primary visual cortex. *Journal of Physiology Paris*, *106*(5-6), 250–265. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0928425712000460 doi: 10.1016/j.jphysparis.2012.08.006

## Book Chapters

**Khambhati, A. N.**, & Chiang, S. (2023). Submitted: Graph and network control theoretic frameworks in epilepsy. In *Statistical Methods in Epilepsy.* Chapman & Hall/ CRC.

## Commentaries

**Khambhati, A. N.**, & Bassett, D. S. (2016). A Powerful DREADD: Revealing Structural Drivers of Functional Dynamics. *Neuron*, *91*(2), 213–215. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0896627316303622 doi: 10.1016/j.neuron.2016.07.011

## Unpublished Preprints

Bertolero, M. A., Adebimpe, A., **Khambhati, A. N.**, Mattar, M. G., Romer, D., Thompson-Schill, S. L., & Bassett, D. S. (2020). Learning differentially reorganizes brain activity and connectivity. *arXiv preprint arXiv:1810.08840*.

Murphy, A. C., Gu, S., **Khambhati, A. N.**, Wymbs, N. F., Grafton, S. T., Satterthwaite, T. D., & Bassett, D. S. (2016). Explicitly Linking Regional Activation and Function Connectivity: Community Structure of Weighted Networks with Continuous Annotation. *arXiv preprint arXiv:1611.07962*. Retrieved from https://arxiv.org/abs/1611.07962

Reddy, P. G., Betzel, R. F., **Khambhati, A. N.**, Shah, P., Kini, L., Litt, B., … Bassett, D. S. (2018). Genetic and neuroanatomical support for functional brain network dynamics in epilepsy. *arXiv preprint arXiv:1809.03934*.

## Patents and Patent Applications

Wu, C., Azarion, A., Wu, J., **Khambhati, A. N.**, Wagenaar, J., Litt, B., & Blanco, J. (2020, January). *Methods, systems, and computer readable media for visualization of resection target during epilepsy surgery and for real time spatiotemporal visualization of neurophysiologic biomarkers.* (Nos. US 10,537,277 B2).

## Open-Source Software and Data

Gardner, A. B., **Khambhati, A. N.**, Brinkmann, B. H., Sturges, B. K., Litt, B., Vite, C. H., … W. Douglas Sheffield (2019). Canine Epilepsy Dataset.
doi: https://doi.org/10.26275/ju7v-hnyy

**Khambhati, A. N.**, & Bassett, D. S. (2017). Non-negative matrix factorization for subgraph analysis of dynamic networks. *https://doi.org/10.5281/zenodo.583150*. doi: 10.5281/zenodo.583150

# Invited Lectures & Presentations

### 2023

**Khambhati, A. N.** (2023a, January). *Brain network reorganization during closed-loop therapy in individuals with depression* [UCSF Dolby Family Center for Mood Disorders Annual Retreat in San Francisco, CA, USA].

**Khambhati, A. N.** (2023b, April). *Optimizing Closed-Loop Brain Circuit Therapeutics* [ICM Distinguished Seminar Series at the Johns Hopkins University in Baltimore, MD].

## 2022

**Khambhati, A. N.** (2022a, December). *The importance of data sharing in epilepsy: NIH guidelines and the BRAIN Initiative* [American Epilepsy Society Meeting: Data Sharing In Epilepsy in Nashville, TN].

**Khambhati, A. N.** (2022b, April). *Probing mechanisms of long-term brain network reorganization during responsive neurostimulation therapy* [UCSF Dolby Family Center for Mood Disorders Annual Retreat in San Francisco, CA, USA].

## 2020

**Khambhati, A. N.** (2020a, December). *Brain network reorganization may predict RNS outcomes in focal epilepsy* [NeuroPace Research Seminar in San Francisco, CA, USA (virtual)].

**Khambhati, A. N.** (2020b, November). *Long-term brain network reorganization may predict RNS outcomes in focal epilepsy* [NeuroPace Scientific Summit in San Francisco, CA, USA (virtual)].

**Khambhati, A. N.** (2020c, June). *Mapping and Targeting "Nodes" for Intervention Using Personalized Models of Seizure Networks* [Neurodiagnostic Lunch and Learn Seminar Series at the University of California, San Francisco in San Francisco, CA, USA (virtual)].

## 2019

**Khambhati, A. N.** (2019, July). *Reverse Engineering Mechanisms of RNS in Epilepsy: Where do we go from here?* [Deep Brain Stimulation Forum at the University of California, San Francisco in San Francisco, CA, USA].

## 2018

**Khambhati, A. N.** (2018, March). *Pushing edges: mapping and driving the reconfiguration dynamics of brain networks* [Brain Functional Organization, Connectivity and Behavior in Whistler, B.C., Canada].

## 2017

**Khambhati, A. N.** (2017a, July). *Control in Meso-Scale Structural and Functional Brain Networks* [SIAM Conference on Control and Its Applications in Pittsburgh, PA, USA].

**Khambhati, A. N.** (2017b, November). *Disentangling rules of network reconfiguration during cognitive control* [Desmond Oathes Lab Meeting at the University of Pennsylvania in Philadelphia, PA, USA].

**Khambhati, A. N.** (2017c, January). *Epilepsy: Dysfunction in Brain Network Synchronization* [Stanley Center for Psychiatric Research at the Broad Institute in Cambridge, MA, USA].

**Khambhati, A. N.** (2017d, April). *Functional brain subgraphs constrain network rules for cognitive control* [International Research Training Group 2150: Spring School at the University of Pennsylvania in Philadelphia, PA, USA].

**Khambhati, A. N.** (2017e, March). *Functional subgraphs of brain networks modulate cognitive control processes between task states* [Keyston Symposium on Connectomics in Santa Fe, NM, USA].

**Khambhati, A. N.** (2017f, September). *Keynote Speaker: Fine-scale mechanisms and rules for brain network reconfiguration during cognition and disease* [Coupling and Causality in Complex Systems in Cologne, Germany].

**Khambhati, A. N.** (2017g, August). *Mapping Subgraphs of Functional Brain Networks in Cognition and Disease* [Brain Behavior Lab Imaging Meeting at the University of Pennsylvania in Philadelphia, PA, USA].

**Khambhati, A. N.** (2017h, December). *Targeting Nodes in Patient-Specific Models of the "Functional" Epileptic Network* [American Epilepsy Society Meeting: Workshop on Data-Driven Modeling in Washington D.C.].

## 2016

**Khambhati, A. N.**, & Bassett, D. S. (2016, October). *Network Controllers of Brain Dynamics* [DARPA Restoring Active Memory: Team Meeting at the University of Pennsylvania in Philadelphia, PA, USA].

### 2014

**Khambhati, A. N.** (2014, July). [Network Visualization Summer Program at the University of Pennsylvania in Philadelphia, PA, USA].

## Conference Abstracts & Proceedings

### 2023

Astudillo Maya, D. A., Sellers, K. K., Stapper, N., **Khambhati, A. N.**, Henderson, C., Fan, J. M., … Krystal, A. D. (2023). Identification of neural biomarkers of major depressive disorder symptom severity using computerized linguistic analysis. *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*.

Cohen, J., Fan, J. M., Sellers, K. K., **Khambhati, A. N.**, Dawes, H. E., Scangos, K. W., … Krystal, A. D. (2023). Amygdala-Hippocampus Coherence is a Biomarker of Predominant Symptom Sets in Patients With Depression. *Biological Psychiatry*, *93*(9), 112–113.

**Khambhati, A. N.**, Stapper, N., Astudillo Maya, D., Henderson, C., Sellers, K. K., Fan, J. M., … Krystal, A. D. (2023). State-dependent neural biomarker of arousal predicts therapeutic state transitions in an individual undergoing responsive neurostimulation treatment for treatment-resistant depression. *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)*.

### 2020

Chiang, S., **Khambhati, A. N.**, Chang, E., & Rao, V. (2020). Evidence of State-Dependence in the Effectiveness of Responsive Neurostimulation for Seizure Modulation. *American Epilepsy Society*.

**Khambhati, A. N.**, Shafi, A., Rao, V., & Chang, E. (2020). Long-term change in interictal network synchrony stratifies outcome to responsive neurostimulation therapy in drug-resistant epilepsy. *American Epilepsy Society*.

Scangos, K. W., Makhoul, G., **Khambhati, A. N.**, Sellers, K., Chang, E. F., & Krystal, A. (2020). Corticocortical Evoked Potentials and Patient Response Reveal Networks Underlying Depression. *Biological Psychiatry*.

Scheid, B. H., Bernabei, J., Becker, D., Davis, K. A., Jeschke, J., **Khambhati, A. N.**, … Litt, B. (2020). Predictive biomarker discovery to improve the clinical application of responsive neurostimulation treatment. *American Epilepsy Society*.

### 2019

Scangos, K., **Khambhati, A. N.**, Daly, P., Dawes, H. E., Krystal, A., & Chang, E. F. (2019). Neurophysiological biotypes of depression identified through intracranial EEG model: Advances for closed-loop deep brain stimulation therapies. *Neuromodulation: The Science*.

Scangos, K., **Khambhati, A. N.**, Daly, P., Shafi, A., Dawes, H. E., Krystal, A., & Chang, E. F. (2019). Resting State Whole Brain Network Activity in Depression From Intracranial EEG Signals. *Biological Psychiatry*.

Wong, J% , Tomlinson, S. B., Conrad, E. C., **Khambhati, A. N.**, & Marsh, E. D. (2019). Virtual Cortical Resection Elucidates Epileptic Network Characteristics In Pediatric Patients With Focal Cortical Dysplasia. *American Academy of Neurology*.

### 2018

Buch, V. P., Brandon, C., **Khambhati, A. N.**, Richardson, A. G., Bassett, D. S., & Lucas, T. H. (2018). Increased dynamic modularity of the fronto-temporo-limbic network precedes enhanced task performance. *American Association of Neurological Surgeons Annual Scientific Meeting*.

Stiso, J., **Khambhati, A. N.**, Tommaso, M., Kahn, A. E., Lucas, T. H., Tracy, J. I., … Bassett, D. S. (2018a). Structural Connectivity Guides Direct Cortical Stimulation Through Optimal State Transitions. *NetSci*.

Stiso, J., **Khambhati, A. N.**, Tommaso, M., Kahn, A. E., Lucas, T. H., Tracy, J. I., … Bassett, D. S. (2018b). White Matter Network Architecture Guides Direct Electrical Stimulation Through Optimal State Transitions. *Conference on Cognitive Computational Neuroscience*.

Stiso, J., **Khambhati, A. N.**, Tommaso, M., Kahn, A. E., Stein, J. M., Das, S. R., … Bassett, D. S. (2018). White Matter Network Architecture Guides Direct Electrical Stimulation Through Optimal State Transitions. *Society for Neuroscience*.

## 2017

Ashourvan, A., Pequito, S., Baldassano, S% , **Khambhati, A. N.**, Litt, B., Pappas, G. J., … Bassett, D. S. (2017). Seizure-onset assessment in ECoG via dynamical stability analysis. *Society for Neuroscience*.

Ashourvan, A., Pequito, S., **Khambhati, A. N.**, Baldassano, S% , Davis, K. A., Lucas, T. H., … Bassett, D. S. (2017). Parsing spatiotemporal dynamical stability in ECoG during seizure onset, propagation, and termination. *ICTALS*.

He, X., Bassett, D., Ganne, C., Kozlowski, L., Alwethinani, S., Kim, N. Y., … Tracy, J. (2017). Functional network dynamics of the language system in temporal lobe epilepsy. *Organization for Human Brain Mapping*.

**Khambhati, A. N.**, Mattar, M. G., & Bassett, D. S. (2017). Non-negative matrix factorization uncovers topological modes of dynamic functional brain networks. *Organization for Human Brain Mapping*.

**Khambhati, A. N.**, Medaglia, J. D., Karuza, E. A., Thompson-Schill, S. L., & Bassett, D. S. (2017). Functional subgraphs of brain networks modulate cognitive control processes between task states. *Keystone Symposium on Connectomics*.

## 2016

Becker, C. O., **Khambhati, A. N.**, Bassett, D. S., & Preciado, V. M. (2016). Identification of networks of Wilson-Cowan neuronal oscillators by inverse sigmoidal transformation. *IEEE Signal Processing in Medicine and Biology Symposium*.

Chai, L. R., **Khambhati, A. N.**, Gur, R. C., Gur, R. E., Satterthwaite, T. D., & Bassett, D. S. (2016). Evolution of Brain Network Dynamics in Neurodevelopment. *Biomedical Engineering Society Meeting*.

**Khambhati, A. N.**, Chai, L., Davis, K. A., Ciric, R., Moore, T. M., Gur, R. C., … Bassett, D. S. (2016). Homeostatic control of functional dynamics in human brain networks. *BRAIN Initiative Investigators Meeting*.

**Khambhati, A. N.**, Davis, K. A., Lucas, T. H., Litt, B., & Bassett, D. S. (2016). Push-pull regulation of seizure evolution in the epileptic network. *Gordon Research Conference: Epilepsy and Neuronal Synchronization*.

Murphy, A. C., Gu, S., **Khambhati, A. N.**, Wymbs, N. F., Grafton, S. T., Satterthwaite, T. D., & Bassett, D. S. (2016). Explicitly Linking Regional Activation and Functional Connectivity: Community Structure of Weighted Networks with Continuous Annotation. *Society for Neuroscience*.

Pequito, S., **Khambhati, A. N.**, Pappas, G. J., Siljak, D. D., Bassett, D. S., & Litt, B. (2016). Structural Analysis and Design of Dynamic-Flow Networks : Implications into the Brain Dynamics. In *American Control Conference.*

## 2015

Blevins, T., **Khambhati, A. N.**, Wagenaar, J., Brinkmann, B., Worrell, G., & Litt, B. (2015). Crowdsourcing Seizure Detection Algorithms using Kaggle and ieeg.org. *American Epilepsy Society*.

**Khambhati, A. N.**, Litt, B., & Bassett, D. S. (2015). Virtual Cortical Resection of the Epileptic Network Reveals Controllers of Seizure Dynamics. *Biomedical Engineering Society Meeting*.

Shah, P., Kini, L., **Khambhati, A. N.**, Davis, K., & Litt, B. (2015). Development of a Pipeline to Integrate High Angular Resolution Diffusion Imaging (HARDI) and Intracranial EEG data in Epilepsy Patients. *American Epilepsy Society*.

## 2014

Baker, D., Feldt Muldoon, S., Gu, S., **Khambhati, A. N.**, Mattar, M., Telesford, Q., … Bassett, D. S. (2014). Characterizing modular structure in neuroimaging data: The network commuity architecture toolbox. *Society for Neuroscience*.

**Khambhati, A. N.**, Litt, B., & Bassett, D. S. (2014). Dynamic functional reconfiguration in human epileptic networks. *Society for Neuroscience*.

### 2008

Poplin, R. E., Potetz, B., **Khambhati, A. N.**, & Lee, T. S. (2008). Behavioral evidence shows that monkeys can see shape from shading. *Society for Neuroscience*.

## Teaching

2016-2016 **Guest Lecturer**, ENM375: Biological Data Science — *Univ. of Penn.*
2016-2016 **Guest Lecturer**, BE566: Network Neuroscience — *Univ. of Penn.*
2013-2015 **Head Teaching Assistant**, BE521: Brain-Computer Interfaces — *Univ. of Penn.*
2012-2012 **Teaching Assistant**, BE521: Brain-Computer Interfaces — *Univ. of Penn.*
2010-2011 **Teaching Assistant**, BE301: Signals and Systems — *Univ. of Penn.*
2008-2008 **Teaching Assistant**, 18-396: Signals and Systems — *Carnegie Mellon*

## Mentorship

### Doctoral Students

2023-CUR **Nandini Periyapalayam Sekar**, University of California, Berkeley-San Francisco (Bioengineering)
2020-2021 **Alex Silva**, University of California, Berkeley-San Francisco (Bioengineering) — *1 pub*
2015-2017 **Jennifer Stiso**, University of Pennsylvania (now: data scientist at Myriad Genetics) — *1 pub*

### Master's Students

2019-2021 **Hector Carbajal-Mendez**, University of California, Berkeley-San Francisco (Bioengineering)
2014-2015 **Tyler Blevins**, University of Pennsylvania (now: data scientist at 1010data) — *1 pub*

### Undergraduate Students

2022-CUR **Carter Lankford**, University of California, Berkeley (Bioengineering)
2016-2017 **Julia Costantini**, University of Pennsylvania (Bioengineering) — *1 pub*
2015-2017 **Lucy Chai**, University of Pennsylvania (now: Ph.D. Student at MIT) — *1 pub*

### Research Assistants

2022-CUR **Noah Stapper**, University of California, San Francisco (now: Ph.D. student at UCSD)
2020-CUR **Tony Liu**, University of California, San Francisco (now: Ph.D. student at Stanford)
2018-2019 **Alia Shafi**, University of California, San Francisco (now: Software Engineer at IRL) — *1 pub*

## Service

### Academic & Research

2023-2023 **Vice Chair of Data Science SIG**, TinyML: Platforms for Portable Data Science in Epilepsy — *Am. Epi. Soc.*
2022-2022 **Incoming Vice Chair of Data Science SIG**, Open Epilepsy Data Ecosystems — *Am. Epi. Soc.*

### University & Community

2022-2022 **Undergraduate Student Mentor**, Brain Outreach Bay Area (BOBA) - Neuroscience DEI Community — *UC San Francisco*
2013-2015 **In-Residence Graduate Associate (Dean Suhnne Ahn)**, Harnwell College House — *Univ. of Penn.*
2011-2012 **Graduate Recruitment Committee**, Department of Bioengineering — *Univ. of Penn.*
2007-2009 **Student Volunteer (Supv. Eileen Mozolak)**, Hospital Elder Life Program — *Univ. of Pitt. Med.*

## Peer-Review

### Review Editor for Following Journals:

Frontiers in Neurology

### Reviewer for Following Journals:

Brain, Cerebral Cortex, Chaos, eLife, eNeuro, Epilepsia, European Journal of Neuroscience, Frontiers in Neurology, Human Brain Mapping, IEEE Transactions on Biomedical Engineering, JAMA Neurology, Journal of Clinical Medicine,

Journal of Neuroscience, Journal of Neural Engineering, Journal of Cognitive Neuroscience, Nature: Scientific Reports, Network Neuroscience, Neural Computation, NeuroImage, NeuroImage: Clinical, PLOS Biology, PLOS Computational Biology, PLOS One, Science Translational Medicine, Sensors

Reviewer for Following Funding Mechanisms:

NIH IDeA Networks of Biomedical Research Excellence (P20)

## Press & Media Coverage

2021/09/28 **Optimizing Brain Stimulation for People with Drug-Resistant Epilepsy**, CURE Epilepsy Discovery
2021/08/30 **Brain Plasticity May Predict [...] Responsive Neurostimulation for Seizures**, AAN: NeurologyToday
2018/09/08 **Penn Research Identifies Brain Network that Controls Spread of Seizures**, Penn News Today
2015/12/17 **Penn Researchers Use Network Science to Help Pinpoint Source of Seizures**, Penn News Today