Alexander G. Huth

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CURRENT POSITION

Assistant professor, Computer Science & Neuroscience, **University of Texas at Austin**, Texas USA   **2017 - present**

EDUCATION

University of California, Berkeley, California USA

– Ph.D., Helen Wills Neuroscience Institute   **2013**

California Institute of Technology, Pasadena, California USA

– M. S., Computation & Neural Systems / Brains, Minds, & Society   **2009**

– B. S., Engineering & Applied Science (focus on Computation & Neural Systems)   **2007**

PREVIOUS POSITIONS

Gallant Lab, University of California, Berkeley, California USA
Postdoctoral scholar   **2013 - 2017**
Graduate student   **2009 - 2013**

Koch Lab, California Institute of Technology, Pasadena, California USA
Graduate student   **2007 - 2008**
Undergraduate researcher   **2006 - 2007**

PEER-REVIEWED PUBLICATIONS

Hamilton, L. S., & **Huth, A. G.** (2018) The revolution will not be controlled: natural stimuli in speech neuroscience. *Language, Cognition and Neuroscience*. doi: 10.1080/23273798.2018.1499946

Matusz, P. J., Dikker, S., **Huth, A. G.**, & Perrodin, C. (2018) Are We Ready for Real-world Neuroscience? *Journal of Cognitive Neuroscience*. doi: 10.1162/jocn_e_01276

Turek, J., & **Huth, A. G.** (2018) Efficient, sparse representation of manifold distance matrices for classical scaling. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, June 2018. arxiv:1705.10887.pdf

de Heer, W. A.*, **Huth, A. G.***, Griffiths, T. L., Theunissen, F. E., & Gallant, J. L. (2017) The hierarchical cortical organization of human speech processing. *The Journal of Neuroscience*, 3267-16. *(* these authors contributed equally)* doi: 10.1523/jneurosci.3267-16.2017

Nishimoto, S., **Huth, A. G.**, Bilenko, N. Y., & Gallant, J. L. (2017). Eye movement-invariant representations in the human visual system. *Journal of Vision*. doi: 10.1167/17.1.11

Huth, A. G., Lee, T., Nishimoto, S., Bilenko, N. Y., Vu, A. T., & Gallant, J. L. (2016). Decoding the semantic content of natural movies from human brain activity. *Frontiers in Systems Neuroscience*. doi: 10.3389/fnsys.2016.00081

Çukur, T., **Huth, A. G.**, Nishimoto, S., & Gallant, J. L. (2016). Functional Subdomains within Scene-Selective Cortex: Parahippocampal Place Area, Retrosplenial Complex, and Occipital Place Area. *The Journal of Neuroscience, 36*(40), 10257-10273. doi: 10.1523/jneurosci.4033-14.2016

Huth, A. G., de Heer, W. A., Griffiths, T. L., Theunissen, F. E., & Gallant, J. L. (2016). Natural speech reveals the semantic maps that tile human cerebral cortex. *Nature*. 532, 453-458. doi: 10.1038/nature17637

Gao, J. S., **Huth, A. G.**, Lescroart, M. D. & Gallant, J. L. (2015). Pycortex: an interactive surface visualizer for fMRI. *Frontiers in Neuroinformatics*. 9:23. doi: 10.3389/fninf.2015.00023

Hamilton, L. S., Sohl-Dickstein, J., **Huth, A. G.**, Carels, V. M., Deisseroth, K., & Bao, S. (2013). Optogenetic activation of an inhibitory network enhances functional connectivity in auditory cortex. *Neuron, 80*(4), 1066-1076. doi: 10.1016/j.neuron.2013.08.017

Çukur, T., **Huth, A. G.**, Nishimoto, S., & Gallant, J. L. (2013). Functional Subdomains Within Human FFA. *The Journal of Neuroscience, 33*(42), 16748-16766. doi: 10.1523/jneurosci.1259-13.2013

Çukur, T., Nishimoto, S., **Huth, A. G.**, & Gallant, J. L. (2013). Attention during natural vision warps semantic representation across the human brain. *Nature Neuroscience, 16*, 763-770. doi: 10.1038/nn.3381

Huth, A. G., Nishimoto, S., Vu, A. T., & Gallant, J. L. (2012). A continuous semantic space describes the representation of thousands of object and action categories across the human brain. *Neuron, 76*(6), 1210-1224. doi: 10.1016/j.neuron.2012.10.014

Gastpar, M. C., Gill, P. R., **Huth, A. G.**, & Theunissen, F. E. (2010). Anthropic correction of information estimates and its application to neural coding. *IEEE Transactions on Information Theory, 56*(2), 890-900. doi: 10.1109/tit.2009.2037053

Milosavljevic, M.*, Malmaud, J.*, **Huth, A.***, Koch, C., & Rangel, A. (2010). The drift diffusion model can account for value-based choice response times under high and low time pressure. *Judgement & Decision Making, 5*, 437-449. (* *these authors contributed equally*) doi: 10.2139/ssrn.1901533

Saenz, M., Lewis, L. B., **Huth, A. G.**, Fine, I., & Koch, C. (2008). Visual Motion Area MT+ Responds to Auditory Motion in Human Sight-Recovery Subjects. *The Journal of Neuroscience, 28*(20), 5141-5148. doi: 10.1523/jneurosci.0803-08.2008

MANUSCRIPTS IN PREPARATION & SUBMISSION

Nunez-Elizalde, A. O., **Huth, A. G.**, & Gallant, J. L. Voxelwise encoding models with non-spherical multivariate normal priors *(submitted)* doi: 10.1101/386318

Jain, S., & **Huth, A. G.** Incorporating Context into Language Encoding Models for fMRI. *(submitted)* doi: 10.1101/327601

Huth, A. G., Griffiths, T. L., Theunissen, F. E., & Gallant, J. L. PrAGMATiC: a Probabilistic and Generative Model of Areas Tiling the Cortex. *(in preparation)* arXiv:1504.03622

Gao, J. S., **Huth, A. G.**, & Gallant, J. L. Reducing head motion during fMRI using a personalized 3D-printed insert. *(in preparation)*

Gao. J. S., **Huth, A. G.**, Nunez-Elizalde, A. O., & Gallant, J. L. Fast fMRI improves signal quality by separating signal and noise spectra. *(in preparation)*

GRANT FUNDING

Alfred P. Sloan Research Fellowship - $65,000　　　　　　　　　　　　　　　　2018-2019

These two-year fellowships are awarded yearly to 126 researchers in recognition of distinguished performance and a unique potential to make substantial contributions to their field.

Burroughs Wellcome Fund Career Award at the Scientific Interface - $500,000　　　2016-2021

This award provides postdoctoral and research funding for quantitative biologists or neuroscientists transitioning into faculty positions. It provides up to two years of postdoctoral funding and three years of faculty-level research funding.

Dingwall Neurolinguistics Dissertation Fellowship - $30,000   2012-2013
Two of these fellowships are awarded yearly to graduate students doing work in the field of neurolinguistics.

Summer Undergraduate Research Fellowship - $5,000   2006
This fellowship supported my research as an undergraduate in Christof Koch's lab at Caltech.

INVITED TALKS

MIND Summer School, Hanover, NH   2018
"Neurobiology of Cognition" Gordon Research Conference, Sunday River, ME
Computational and cognitive neuroscience summer school, Suzhou, China
University of Texas at San Antonio, San Antonio, TX
Columbia University, New York, NY
Baylor College of Medicine, Houston, TX

Max Planck Institute, Leipzig, Germany   2017
University of California, Santa Barbara, CA
Mind Science Foundation, San Antonio, TX
Science@Cal Lecture Series, Berkeley, CA
Starkey Hearing Technologies, Berkeley, CA
yConf, San Francisco, CA

Showcase, Allen Institute, Seattle, WA   2016
Duke University, Durham, NC
Dolby, San Francisco, CA
BMC seminar, UCLA, Los Angeles, CA
University of Texas, Austin, TX

Pattern Recognition in Affective Neuroscience workshop, Society for Affective Science, Oakland, CA   2015
Memory and Decision Making Lunch, Stanford University, Palo Alto, CA
Computer Graphics & Visualization Seminar, College of Charleston, Charleston, SC
Dartmouth College, Hanover, NH
International Computer Science Institute, Berkeley, CA

Cognition and Computation Reading Group, Stanford University, Palo Alto, CA   2014
Neurospin, Saclay, France

Vision Lunch, Stanford University, Palo Alto, CA   2013

SERVICE
Member
Polymathic Scholars Steering Committee, University of Texas at Austin   **2017-present**
Allen Institute Next Generation Leaders Council   **2016-present**

Reviewer

eLife	2017-
Nature Communications	2017-
Proceedings of the National Academy of Sciences (PNAS)	2016-
Journal of Neuroscience	2015-
Human Brain Mapping	2015-
Neuroimage	2015-
PLoS Computational Biology	2014-
Frontiers in Human Neuroscience	2014-
Journal of Cognitive Neuroscience	2012-

Student Representative to Helen Wills Neuroscience Institute Executive Committee 2012-2013
   & Director Search Committee

Conference Abstracts

2018

Popham, S. F., **Huth, A. G.**, Bilenko, N. Y., & Gallant, J. L. (2018) Visual and linguistic semantic representations are aligned at the boundary of human visual cortex. Presented by SP at *Cosyne 2018*.

2017

Wehbe, L., Nunez-Elizalde, A. O., **Huth, A. G.**, Deniz, F., Bilenko, N. Y., & Gallant, J. L. (2017) Deep Multi-view Representation Learning of Brain Responses to Natural Stimuli. Presented by LW at *Cognitive Computational Neuroscience (CCN) 2017*.

Nunez-Elizalde, A. O., **Huth, A. G.**, & Gallant, J. L. (2017) Improving Predictive Models Using Non-Spherical Gaussian Priors. Presented by AONE at *Cognitive Computational Neuroscience (CCN) 2017*.

Huth, A. G. (2017) Using voxelwise encoding models to study cortical representations. Talk at *Organization for Human Brain Mapping (OHBM) 2017*.

Nunez-Elizalde, A. O., **Huth, A. G.**, Oliver, M., & Gallant, J. L. (2017) Unstated assumptions in representational similarity analysis. Presented by AONE at *Organization for Human Brain Mapping (OHBM) 2017*.

Wehbe, L., **Huth, A. G.**, Deniz, F., Kieseler, M.-L., & Gallant, J. L. (2017) Automated simulation of fMRI experiments. Presented by AGH as poster and talk at *Organization for Human Brain Mapping (OHBM) 2017*.

Huth, A. G. (2017) Using natural stimuli study the human cortex. Talk at *Cognitive Neuroscience Society (CNS) 2017*.

2016

Huth, A. G., Popham, S. F., Bilenko, N. Y., & Gallant, J. L. (2016) The visual-linguistic interface: anatomically aligned semantic representations of vision and language. Presented by AH and SP at *Society for Neuroscience 2016*.

Huth, A. G., & Gallant, J. L. (2016) Using voxel-wise modeling of fMRI responses to natural stories and movies to study semantic representations in cortex. Talk at *Society for Neuroscience 2016*.

Nunez-Elizalde, A. O., **Huth, A. G.**, & Gallant, J. L. (2016) Improving predictive models using non-spherical Gaussian priors. Presented by AONE at *Society for Neuroscience 2016*.

Imamoglu, F., **Huth, A. G.**, & Gallant, J. L. (2016) The representation of semantic information during listening and reading. Presented by FI at *Society for Neuroscience 2016*.

Huth, A. G., Popham, S. F., Bilenko, N. Y., & Gallant, J. L. (2016) Semantic representations of language and vision revealed by fMRI with natural stimuli. Presented by AH at *Collaborative Research in Computational Neuroscience (CRCNS) 2016*.

Feather, J., **Huth, A. G.**, & Gallant, J. L. (2016) Tikhonov regularized regression for voxel-wise modeling of fMRI responses to natural stories. Presented by JF at *Pattern Recognition in Neuroimaging (PRNI) 2016* and *Organization for Human Brain Mapping (OHBM) 2016*.

2015

Nishida, S., **Huth, A. G.**, Gallant, J. L., & Nishimoto, S. (2015) Word statistics in large-scale texts explain the human cortical semantic representation of objects, actions, and impressions. Presented by S. Nishida at *Society for Neuroscience 2015*.

Oldfield, C. S., **Huth, A.**, Chavez, M., Hoagland, A., Carroll, E. C., Prendergast, A., Wyart, C., & Isacoff, E. Y. (2015). Experience shapes prey capture behavior and neural representations in larval zebrafish. Presented by CSO at *Society for Neuroscience 2015*.

Abdel-Ghaffar, S., Gallant, J., **Huth, A.**, Stansbury, D., Cowen, A., & Bishop, S. (2015). Using voxel-wise encoding models to study occipito-temporal representations of the animacy, semantic and affective content of natural images. Presented by SA-G at *Vision Sciences Society Meeting*.

Huth, A. G., de Heer, W.A., Griffiths, T. L., Theunissen, F. E., & Gallant, J. L. (2015). PrAGMATiC: a Probabilistic and Generative Model of Areas Tiling the Cortex. Presented at *Cosyne 2015*.

2014

Huth, A. G., Griffiths, T. L., & Gallant, J. L. (2014). PrAGMATiC: a Probabilistic and Generative Model of Areas Tiling the Cortex. Presented at *Society for Neuroscience 2014*.

Çukur, T., Nishomoto, S., **Huth, A. G.**, & Gallant, J. L. (2014). Visual search for action categories alters semantic representation in the human brain. Presented by TÇ at *Society for Neuroscience 2014*.

Abdel-Ghaffar, S. A., **Huth, A. G.**, Stansbury, D. E., Cowen, & A. S., Bishop, S. J. (2014). Intertwined affective and semantic representations of the world around us: Applying voxel-wise encoding models to studying the cortical representation of emotional natural images. Presented by SA-G at *Society for Neuroscience 2014*.

Huth, A.G., Griffiths, T.L., & Gallant, J.L. (2014). PrAGMATiC: a Probabilistic and Generative Model of Areas Tiling the Cortex. Presented by JLG at *IEEE EMBS Brain Grand Challenges Conference*.

2013

Huth, A. G., de Heer, W. A., Theunissen, F. E., Griffiths, T. L., & Gallant, J. L. (2013). Cortical organization of semantic representations for natural speech revealed by fMRI. Presented at *Society for Neuroscience 2013*.

de Heer, W. A., **Huth, A. G.**, Griffiths, T. L., Gallant, J. L., & Theunissen, F. E. (2013). A combined model of speech perception indicates hierarchical representation of speech in the brain. Presented by WAdH at *Society for Neuroscience 2013*.

Bilenko, N. Y., **Huth, A. G.**, Nishimoto, S., & Gallant, J. L. (2013) Functional cross-subject mapping predicts brain activity to novel natural movies and speech. Presented by NYB at *Society for Neuroscience 2013*.

Gao, J. S., **Huth, A. G.**, & Gallant, J. L. (2013) Pycortex: a Python program for interactive surface visualization of fMRI data. Presented by JSG at *Society for Neuroscience 2013*.

Nishimoto, S., **Huth, A. G.**, Bilenko, N. Y., & Gallant, J. L. (2013). Human visual areas invariant to eye movements during natural vision. Presented by SN at the *Vision Sciences Society Meeting*.

Hamilton, L. S., Sohl-Dickstein, J., **Huth, A. G.**, & Bao, S. (2012). Optogenetic stimulation of an inhibitory network enhances feedforward connectivity in auditory cortex. Presented by LSH at *Society for Neuroscience 2012*.

Çukur, T., **Huth, A. G.**, Nishomoto, S., Vu, A. T., & Gallant, J. L. (2012). Voxel-wise category tuning curves reveal several functional subdomains within human FFA. Presented by TÇ at *Society for Neuroscience 2012*.

Çukur, T., Nishimoto, S., **Huth, A.G.** & Gallant, J.L. (2012). Category-based attention shifts tuning toward the target object category during natural visual search. Presented by TÇ at *Vision Sciences Society 2012*.

Huth, A. G., Lee, T., Nishimoto, S., Vu, A. T., & Gallant, J. L. (2012). Decoding semantic content from fMRI responses to natural movies. Presented at *Cosyne 2012*.

Çukur, T., Nishimoto, S., **Huth, A. G.**, & Gallant, J. L. (2011) Object-based attention shifts semantic selectivity toward an attended object category during natural vision. Presented by TÇ at *Society for Neuroscience 2011*.

Huth, A. G., Nishimoto, S., Vu, A. T., Griffiths, T. L., & Gallant, J. L. (2010). Using linguistic models to predict and decode fMRI responses to natural movies. Presented at *Society for Neuroscience 2010*.

Bilenko, N. Y., Vu, A. T., Naselaris, T., **Huth, A. G.**, & Gallant, J. L. (2010). How much tuning information is lost when we average across subjects in fMRI experiments? Presented by NYB at *Vision Sciences Society Meeting*.

Huth, A. G., Cadieu, C. F., Dale, C., Weber, D., Pantazis, D., Darvas, F., Leahy, R., Simpson, G., & Koepsell, K. (2009). Detecting functional connectivity in networks of phase-coupled neural oscillators. *Frontiers in Systems Neuroscience. Conference Abstract: Computational and systems neuroscience*. Presented at *Cosyne*.

Cerf, M., Harel, J., **Huth, A. G.**, Einhäuser, W., & Koch, C. (2008). Decoding what people see from where they look: predicting visual stimuli from scanpaths. *WAPCV Conference Proceedings*. Presented by MC at *Workshop on Attention in Cognitive Systems*.

Huth, A. G., Wilimzig, C., Zinn, L., & Koch, C. (2008). The indirect role of saliency in selection for short-term visual memory. Presented at the *Vision Sciences Society Meeting*.

Teaching Experience

MIND Summer School, Dartmouth College   2018

Taught module on voxel-wise encoding models and regression analysis for fMRI data.

CCNSS Summer School, Suzhou, China   2018

Co-taught module on low-dimensional spaces and regression for the Computational and cognitive neuroscience summer school at Cold Spring Harbor Asia.

Neuroscience for Computer Scientists, University of Texas at Austin   2017

CS 395 T special topics computer science course on inferring what algorithms are used by computational systems. Using black box system identification to understand the function of real neural/brain systems. Using gradient propagation and other methods to understand the function of artificial neural networks. Course website: http://www.cs.utexas.edu/~huth/courses.html

Machine learning for neuroimaging, University of Buenos Aires (UBA) 2017

Five-day (15-hour) intensive course on machine learning, system identification, and doing neuroscience with natural stimuli. Taught at the Escuela de Ciencias Informaticas (ECI) winter school in 2017.

Neuroscience Bootcamp, University of California, Berkeley 2011-2013

Developed and taught intensive one-day neuroimaging laboratory tutorial for incoming neuroscience graduate students in 2011 and 2012. Taught lecture on cognitive neuroimaging and fMRI in 2013.

Introductory Undergraduate Neuroscience, University of California, Berkeley 2010-2011

Graduate Student Instructor for MCB 61: Brain, Mind, and Behavior (700+ student introductory class) in 2010. Head Graduate Student Instructor for same in 2011. Instructor: David Presti.

Introductory Probability and Statistics, California Institute of Technology, Pasadena 2008

Teaching assistant for CNS 286: Introduction to Probability, Statistics, and Random Processes for graduate students. Instructor: Leonard Mlodinow.