

# BENJAMIN K. DICHTER, PH.D.

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844 Rose Dr.  
Benicia, CA 94510

## EDUCATION

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- PhD** UC Berkeley and UCSF Joint Program in Bioengineering September 2017  
Major: Neural Systems  
Minor: Machine Learning
- BS** University of Pittsburgh, Bioengineering April 2012  
Concentration: Biosignals & Imaging Systems  
GPA 3.92, Graduated *Summa Cum Laude*  
Outstanding Biosignals & Imaging Systems Student

## RESEARCH

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- Allen Institute** 2020 - present  
Interactive data visualization consultant
- Massachusetts Institute of Technology** 2019 – present  
DANDI Community Liaison
- Lawrence Berkeley National Labs**  
NWB Community Liaison for Neurodata Without Borders Jan 2019 – present
- Stanford University**  
Data Science Consultant for Dr. Ivan Soltesz Jan 2018 - present
- Acting as lead data scientist for a U19 Data Science Core
  - Converting electrophysiology data, optical physiology data, and simulation outputs to the Neurodata Without Borders format using MATLAB and python
- University of California - Berkeley and San Francisco** Sept 2012 - Sept 2017  
Graduate Researcher, Advisor: Dr. Edward Chang (UCSF)
- Applying machine learning to neural responses of auditory tasks recorded in humans using ECoG
  - Studying the neural control of the glottis for pitch variation in speech
  - Studying variability in neural response to linguistic auditory stimuli
- Rotating graduate student, Advisor: Dr. Philip Sabes (UCSF)
- Explored theoretical computational models for neural sensory integration by developing new recurrent neural networks.
- Rotating graduate student, Advisor: Dr. Jack Gallant (Berkeley)
- Used deep belief networks to model the fMRI response of the human visual system
- NeuroVista Corporation**, Seattle, WA Summer 2012  
Algorithm Development Intern

- Used Machine Learning to analyze large ECoG datasets in MATLAB
- Applied my skills acquired in academic research to industry

### University of Pittsburgh

Undergraduate Researcher, Advisor: Dr. Aaron Batista 2010 to 2012

- Data analysis of multi-unit intracranial neural recordings
- Non-human primate training and caretaking
- Spike sorting using TDT

Undergraduate Researcher, Advisor: Dr. Andy Schwartz 2009 to 2010

- Spike sorting using Plexon

### University of Pennsylvania

Lab Assistant, Epilepsy Research Center Summers 2004 to 2009

- Helped design and test video seizure detection
- Implanted intracranial electrodes in mice and rats
- Analyzed intracranial EEG during seizures using MATLAB

## TEACHING

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### University of California - San Francisco

Taught MATLAB for Neural and Behav. Data Analysis grad course Fall 2016

Co-taught a student-run graduate course on MATLAB Summer 2013

### Calliope Mentoring

2015-2016

Mentored high school students in AP Physics, Calculus, Statistics, and Geometry

### University of San Francisco

Fall 2014

TA- Instructed and evaluated a physics lab.

### University of California - Berkeley

Summer 2013

Teaching Assistant for CRCNS workshop: computational models of neural data

### University of Pittsburgh

#### Undergraduate Teaching Assistant

Spring 2011

Course: Circuits Lab - Biodevices

### Mission Acceptance Mentor

2010-2011

Mentored high school students during college selection and application

## PUBLICATIONS

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Chandravadia N, et al. (2020) "A NWB-based dataset and processing pipeline of human single-neuron activity during a declarative memory task." Scientific Data.

Dai K, et al. (2020) "The SONATA data format for efficient description of large-scale network models." PLoS Comp. Bio.

Tritt AJ, Rübél O, **Dichter BK**, et al. (2019) "HDMF: Hierarchical Data Modeling Framework for Modern Science Data Standards." 2019 IEEE International Conference on Big Data (Big Data)

(2019) “iEEG-BIDS, extending the Brain Imaging Data Structure specification to human intracranial electrophysiology”

Rübel O, Tritt A, **Dichter BK**, et al. (2019) “NWB:N 2.0: An Accessible Data Standard for Neurophysiology.” *bioRxiv*. <https://doi.org/10.1101/523035>.

**Dichter BK**, Breshears JD, Leonard MK, Chang EF (2018) “The Control of Vocal Pitch in Human Laryngeal Motor Cortex.” *Cell*.

**Dichter BK**, Bouchard KE, Chang EF (2016) “Dynamic Structure of Neural Variability in the Cortical Representation of Speech Sounds.” *Journal of Neuroscience*.

Makin JG\*, **Dichter BK\***, Sabes PN (2015) Learning to Estimate Dynamical State with Probabilistic Population Codes. *PLoS Comput Biol* 11(11): e1004554.  
doi:10.1371/journal.pcbi.1004554

Bouchard KE\*, Conant DF\*, Anumanchipalli GK, **Dichter BK**, Chaisanguanthum KS, Johnson K, Chang EF (2016) High-resolution, non-invasive imaging of upper vocal tract articulators compatible with human brain recordings. *PLOS ONE*

Godlove J, Gulati T, **Dichter BK**, Chang EF (2016) Muscle synergies after stroke are correlated with perilesional high-gamma oscillations. *Annals of Clinical and Translational Neurology*.

Makin JG, **Dichter BK**, Sabes PN (2016) Recurrent Exponential-Family Harmoniums without Backprop-through-Time. *Journal of Machine Learning Research* (in review)

Jiang W, Pailla T, **Dichter BK**, Chang EF, Gilja V (2016) Decoding speech using the timing of neural signal modulation. *IEEE EMBS Conference Proceeding*.

Pailla T, Jiang W, **Dichter BK**, Chang EF, Gilja V (2016) ECoG Data Analyses to Inform Closed-loop BCI Experiments for Speech-based Prosthetic Applications. *IEEE EMBS Conference Proceeding*. (talk)

## POSTERS AND PRESENTATIONS

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**Dichter, B.**, Dai K., Milstein, A., et al., NWB extension for storing results of large-scale neural network simulations. Talk at NeuroInformatics. Montreal, Canada (2018).

**Dichter, B.** Breshears, J., Leonard, M., Chang E. F. Using ECoG to understand the representation of vocal pitch in humans. Plenary speaker at Tonal Aspects of Language. Berlin (2018).

**Dichter, B.**, Breshears, J., Leonard, M., Chang E. F., Human larynx cortex in speech production. Cognitive Neuroscience Conference, Neural Basis of Speech Production Symposium. San Francisco. (2017).

**Dichter, B.**, Breshears, J., Leonard, M., Chang E. F., Human larynx cortex in speech production. Center for Neural Engineering and Prosthesis Annual Retreat. San Francisco. (2016).

**Dichter, Benjamin**, Leonard, Matthew, Chang, Edward. Cortical control of pitch. Society for the Neurobiology of Language, Sensorimotor Speech Processing Symposium. (2016).

**Dichter, B.**, Bouchard, K. E., Chang E. F., Dynamics of variability and information encoding in electrocorticography recordings during production and perception of syllables. 2014 Neuroscience Meeting Planner. Washington D.C.: Society for Neuroscience, 2014. Online.

**Dichter B\***, Makin J\*, Sabes P, The recurrent exponential family harmonium as a model for tracking a moving stimulus. 2014 Sloan-Swartz poster, Seattle USA

Makin J\*, **Dichter B\***, Sabes P, Learning to track moving stimuli with population codes. 2014 Cosyne Abstracts 2014, Salt Lake City USA

**Dichter B\***, Makin J\*, Sabes P, Learning to Track a Moving Stimulus with Population Codes. 2013 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2013. Online.

## HONORS AND AWARDS

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Graduate Research Fellowship Program - National Science Foundation	2014-2017
Guggenheim Scholarship – Guggenheim Foundation	2008-2012
Brackenridge Fellowship - University of Pittsburgh Honors College	2011
Dean’s List – University of Pittsburgh	2008-2011
Swanson School of Engineering Scholarship – University of Pittsburgh	2008-2012
Full Tuition Scholarship - University of Pittsburgh	2008-2012