

# Kevin S Chen

[GitHub](#) | [ORCID](#) | [ResearchGate](#) | [Webpage](#)

Location: Princeton, NJ, USA

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## SYSTEMS NEUROSCIENTIST AND BIOPHYSICIST

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I am a senior graduate student studying behavioral and neural dynamics in the worm *C. elegans*. I am fluent in Matlab and Python, experienced in biophysical experiments, and am familiar with neural circuits in the visual system and invertebrate animal behavior.

## EDUCATION

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### Princeton University

*PhD in Neuroscience, quantitative track (obtained MS in 2019); Statistics and Machine Learning certificate*  
Advisors: Andrew Leifer and Jonathan Pillow

Princeton, NJ, USA

Sep. 2017 – current

### National Taiwan University

*Master of Science; Institute of Physics, Academia Sinica*  
Advisors: Chi-Keung Chan, Chun-Chung Chen, and Chen-Tung Yen

Taipei, Taiwan

Sep. 2015 – May 2017

### National Taiwan University

*Bachelor of Science in Life Sciences, certificate in Neuroscience*

Taipei, Taiwan

Sep. 2011 – May 2015

## RESEARCH EXPERIENCE

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### Dr. Andrew Leifer's lab and Dr. Jonathan Pillow's lab, Princeton Neuroscience Institute (PNI)

*PhD thesis studies and student researcher at the Center for Physics of Biological Functions (CPBF), Princeton*  
From olfactory navigation behavior to stochastic neural dynamics in *C. elegans*

Apr. 2018 – current

### Dr. Michael Berry's lab and Dr. David Tank's lab, PNI

*Graduate student rotation project*  
Experiments and modeling for predictive coding in mouse primary visual cortex

Jun. 2017 – Mar. 2018

### Dr. CK Chan's and Dr. Chun-Chung Chen's lab, Institute of Physics, Academia Sinica, Taiwan

*Undergrad independent project and Master thesis studies*  
Predictive coding and nonlinear dynamics in the retina

Jul. 2013 – May 2017

### Dr. Tetsuya Yagi's lab, Center for Medical Engineering and Informatics, Osaka University, Japan

*Project-based visiting student scholar*  
Methods for patch-clamp and whole-cell recording in mouse retinal ganglion cells

Aug. 2016

### Dr. Hsian-Rong Tseng's lab, California NanoSystems Science Institute, UCLA, USA

*Summer International Academic Exchange*  
Gene deliver through supra-molecular nanoparticle and silicon nanowires for cell reprogramming and gene reporter systems

Jun. – Aug. 2014

### Dr. Hong-Ren Jiang's lab, Institute of Applied Mechanics, National Taiwan University (NTU)

*Graduate-level in-class monographic study*  
Interaction between active particles and polymer under heating through infrared scanning laser

Jan. – Jun. 2013

### Dr. Yen-Rong Chen's lab, department of Biochemical Science and Technology, NTU

*International genetically engineered machine competition*  
Novel biological-based osmotic sensor utilizing *E. coli* ompC/F promoters and pigment protein encoding genes

Feb. 2012 – Dec. 2012

### Dr. Jiun-Hong Chen's lab, department of Life Science, NTU

*Undergraduate rotation projects*  
Influence of electric field in body polarity during head regeneration of *Aeolosoma viride*

Sep. 2011 – Jun. 2012

### Dr. En-Chang Yang's lab, department of Entomology, NTU

*Independent study for young scientist (high school) development program*  
Feature extraction of patterns by visual experience and top-down processing in honeybees

Jul. 2009 – Jun. 2011

## PUBLICATION AND PREPRINT

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- Chen, Kevin S., Jonathan W. Pillow, and Andrew M. Leifer. (2023). Olfactory learning alters navigation strategies and behavioral variability in *C. elegans*. arXiv:2311.07117.
- Chen, Kevin S., Rui Wu, Marc H. Gershow, and Andrew M. Leifer. (2023). Continuous odor profile monitoring to study olfactory navigation in small animals. eLife 12:e85910.
- Creamer, M. S., Chen, K. S., Leifer, A. M., & Pillow, J. W. (2022). Correcting motion induced fluorescence artifacts in two-channel neural imaging. PLoS computational biology, 18(9), e1010421.
- Chen, Kevin S. Optimal Population Coding for Dynamic Input by Nonequilibrium Networks. Entropy 24.5 (2022): 598.
- Homann, J., Koay, S. A., Chen, K. S., Tank, D. W., & Berry, M. J. (2022). Novel stimuli evoke excess activity in the mouse primary visual cortex. Proceedings of the National Academy of Sciences, 119(5), e210882119.
- Chou, P.Y., Chien, J.F., Chen, K.S., Huang, Y.T., Chen, C.C. and Chan, C.K., (2021). Anticipation and negative group delay in a retina. Physical Review E, 103(2), p.L020401.

- Chen, Kevin S. (2020). Nonequilibrium thermodynamics of input-driven networks." arXiv:2012.13252.
- Chen, C-C., Chen, K. S., Chan, CK. (2017) Active Prediction in Dynamical Systems. Neural Information Processing.
- Chen, Kevin S, Chun-Chung Chen, and C. K. Chan. (2017). "Characterization of predictive behavior of a retina by mutual information." Frontiers in computational neuroscience 11: 66.
- Yang, Y-J., Chen, K. S., Chen, C-C, Chan, CK. (2016) Anticipative Dynamics in the Retina. Taiwanese Physics Bimonthly.
- Liu, Y., Du, J., Choi, J. S., Chen, K. S., Hou, S., Yan, M., ... Tseng, H-R & Wang, H. (2016). A high-throughput platform for formulating and screening multifunctional nanoparticles capable of simultaneous delivery of genes and transcription factors. Angewandte Chemie, 128(1), 177-181.

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## RECENT CONFERENCE PRESENTATION AND ORGANIZATION

- Society for Neuroscience meeting: 'Behavioral Individuality as a Neuroscientific Variable'. Nov. 2023 in DC. (Co-chair)
- Society for Neuroscience meeting: Neuroethology of the Sensorimotor System session. Nov. 2023 in DC. (talk)
- Navigational Algorithms and Neural Circuit Computations Directing Olfactory Search Across Species. Mar. 2023 at Janelia. (poster)
- Computational and Systems Neuroscience meeting. Mar. 2023 in Montreal. (poster)
- American Physical Society March meeting. Mar. 2023 in Las Vegas. (talk)
- C. elegans Topic Meeting: neuronal development, synaptic function and behavior. Jul. 2022 in Vienna. (poster)
- In-house seminar at Princeton Neuroscience Institute. Apr. 2022. (talk)
- Neural Circuits. Mar. 2022 at Cold Spring Harbor Laboratory. (poster)

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## AWARDS

- Outstanding performance, alternative military service under CDC, Taiwan (May 2020)
- J. McDonnell Fellowship in Neuroscience, Princeton (Feb. 2018)
- National Taiwan University (NTU) Dean's award (Jun. 2017)
- NTU college of Life Science poster fair: Merit award (Jun. 2016)
- Annual Meeting of the Physical Society of Taiwan: Merit award (Jan. 2016)
- NTU presidential award (top 5% in class) (Jun. 2015)
- NTU Center for international academic exchange: internship funding for UCLA (Jun. 2014)
- National Science Council: research scholarship (Feb. 2014)
- Intel international science and engineering fair (ISEF): third place grand award (May 2011)
- Taiwan international science fair: Young scientist award and first place grand award (Feb. 2011)

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## TECHNICAL SKILLS

<b>Programming</b>	: MATLAB (fluent), Python (with focus on numpy, scikit-learn, Pytorch), C++ (working knowledge)
<b>Statistical tools</b>	: Excel, SPSS, OriginLab, R
<b>Dev Tools</b>	: Git, GitHub, Anaconda, Bash command line (basics)
<b>Experimental skills:</b>	Labview (familiar), Arduino (working knowledge), electrophysiology (patch-clamp and multi-electrode recording), molecular biology (basics of cloning), optical experiments, machine-shop (certified)

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## TEACHING AND PROFESSIONAL POSITIONS

- Teaching assistant for 'Neural Dynamics', with Dr. David Tank (Spring 2019)
- Teaching assistant for 'Introduction to Neuroscience', with Dr. Ilana Witten (Fall 2018)
- Student researcher in the Center for Physics of Biological Functions (CPBF), Princeton. (2018 – current)
- Alternative military service under Taiwan Centers for Disease Control (Aug. 2020 – Aug. 2021)
- Research mentorship at Princeton: Undergrad students: John Li, Anthony Fisher (Neuro.), Alicia Castillo (Mol-Bio.), Mykhailo Bilokur (Physics); Graduate students: Chase Goddard (Physics), Emily Osborne (Physics), and Jiayi Zhang (Quantitative Bio.)

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## OUTREACH AND LEADERSHIP

- Chair of Princeton Association for Taiwanese Students (2018-2020)
- Squad leader for the alternative military service group, Taiwan. (Aug. 2020 – Aug. 2021)
- Princeton Neuroscience Outreach teaching at Trenton (2019)
- ReMatch undergraduate research mentoring program, Princeton (2018-2020)
- Popular science translator at The Investigator platform (English to Mandarin in Taiwan) (2015 – current)
- Chief of academic office, NTU student association (2012 – 2013)
- Volunteer service for ecological conservation education at Maolin Elementary school, Taiwan (2011 – 2012)
- Student congressmen at NTU (2012)
- Vice-captain of NTU college basketball team (2011 – 2013)