# Jieyu Zheng

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## EDUCATION

**California Institute of Technology, Pasadena, U.S.A.** Sep. 2020 - Present

Doctor of Philosophy in Neurobiology, Expected in Aug. 2026

Thesis topic | The Routing Problem: Understanding Cognitive Flexibility in Maze Navigation and Microtasking

Supervisor: Dr. Markus Meister, Biaggini Professor of Biological Sciences

2023 Chen Diversity and Inclusion Grant Awardee

**University of Cambridge, Cambridge, U.K.** Oct. 2018 - Jul. 2019

Master of Philosophy in Psychology and Education (First Class). Supervisor: Wendy Browne
Thesis: Understanding Shame in Mathematical Achievement – A Systematic Review Using Meta-analysis
Peer-reviewer for Cambridge Open Review Educational Research Journal (2019)

**Cornell University, Ithaca, NY, U.S.A.** Aug. 2016 - May 2018

Bachelor of Science in Biological Engineering, Magna Cum Laude (GPA:3.80/4.3)
College of Agriculture and Life Sciences (CALS) Dean's List (GPA above 3.50 Every Semester)
2018 Rhodes Scholarship in China Finalist

**Shanghai Jiao Tong University (SJTU), Shanghai, China** Sep. 2014 - Jun. 2016

Bachelor of Engineering in Food Science and Engineering
Zhiyuan Honor Degree and Scholarship (Top 5%)
GPA (overall): 3.91/4.3; Total-grade ranking before transfer to Cornell: 1/162
China National Scholarship (Top 1%)

## RESEARCH EXPERIENCES

**Mice in Manhattan: Efficient Exploration and Automated Theory Testing in a Rapidly Reconfigurable Maze** |

*Principal Investigator* Dec. 2021 - Present

Supervisor: Markus Meister, Professor of Biological Sciences; Pietro Perona Professor of Electrical Engineering, Caltech.

- Designed behavioral apparatus, experiments and built the arena for testing and recording.
- Processed the videos and analyzed data using self-developed python packages.
- Presented at SfN 2022, Curiosity, Creativity and Complexity 2023 (with Travel Award), Simons Collaboraton on the Global Brain (SCGB 2023 site visit).

**Mesolimbic Dopamine Signaling and Cognitive Flexibility** | *Research Assistant* Sep. 2019 - Feb. 2020

Supervisor: Trevor Robbins, Professor of Cognitive Neuroscience, University of Cambridge

- Maintained facilities and trained rat subjects for four different behavioral paradigms. Performed microinfusion on animals.
- Analyzed behavioral test results, fitted with reinforcement learning models, using R.

**High Fat Diet and Alzheimer's Disease-related Pathology |** *Research Assistant* Oct. 2016 - May 2018

Advisor: Chris Schaffer, Associate Professor of Meinig School of Biomedical Engineering, Cornell University

- Obtained and analyzed stacked images of mouse cerebral vasculature via three-photon microscopy.
- Conducted immunohistological staining of brain tissues and obtained images via one-photon microscopy.
- Monitored behavioral assessments of mice and programmed analytical sheets.
- Analyzed stall counting data for EyesOnALZ, a crowdsourcing website for Alzheimer research.

***Ex vivo* Imaging of *Drosophila* Olfactory System Development** | *Research Assistant* May - Aug. 2017

Advisor: Liqun Luo, Professor of Biology, Investigator of Howard Hughes Medical Institute, Stanford University

- Set up Drosophila melanogaster crosses for dynamic process imaging.
- Conducted confocal and two-photon imaging of dissected and ex vivo cultured Drosophila pupal brain tissues.
- Processed and analyzed confocal images and two-photon images.
- Presented final results to the Zhiyuan Honor Research Scholarship Committee, awarded 1st prize.

**Functions of CXCL12 during Recovery from Ischemic Strokes in Mice |** *Research Assistant* Jan. - Oct. 2015

Advisor: Yongting Wang, Professor of Med-X Neuroscience and Engineering Centre, SJTU

- Generated four types of mutated plasmids as genetic therapy for ischemic stroke.
- Conducted virus packaging of mutated plasmids in preparation for cell and animal tests.
- Submitted Participation in Research Project (PRP) summary essay and presentation.

## TEACHING AND ADVISING EXPERIENCES

**CNS 187 Neural Computation** | *Head Teaching Assistant* Spring 2022, 2023

Instructors: Markus Meister & Ueli Rutishauser, Professors of Computation & Neural Systems, Caltech

- Designed and graded weekly homework assignments and final projects.
- Held weekly office hours and monitored online discussion forums.
- Oversaw course logistics, lecture recording and attendance.

**BEE 2600 Principles of Biological Engineering** | *Undergraduate Teaching Assistant* Jan. - Dec. 2017

Advisor: Mingming Wu, Associate Professor of Department of Biological Engineering, Cornell University

- Designed a homework assignment about growth kinetics in a neurobiological background.
- Held weekly office hours and TA meetings and monitored Piazza, an online Q&A platform for the course.
- Graded homework and proctored examinations.

**President for the Neurotechers,** Caltech Jun. 2023 - Present

**Academic Event Co-chair for the Neurotechers**, Caltech Feb. 2022 - Jun. 2023

Data Science and AI for Neuroscience Summer School, Caltech | *Participant* Jul. 2022

Executive Education Programs at Møller Centre, University of Cambridge | *Client Relationship Assistant* Jul. - Sep. 2019

Cornell Cooperative Extension for Students with Special Needs | *Mentor* Feb. - May 2018

Cornell Empathy, Assistance and Referral Service (EARS) | *Peer Counsellor* Aug. - Dec. 2017

Harvard College AUSCR Summit for Young Leaders in China | *Exceptional Teaching Fellow* Aug. 2018

BEE 4890 Social Entrepreneurship with the SOS Children's Village in Chile | *Project Manager* Aug. - Dec. 2017

China Thinks Big Venture Challenge Program | *Team Leader* Jan. 2015

## PUBLICATIONS

**Zheng, J.,** Hu, J., Guimaraes, R., Perona, P. and Meister, M. (In prep). Mice in Manhattan: Rapid Learning and Flexible Routing in a Massively Reconfigurable Maze.

Turan, Z., **Zheng, J.,** and Meister, M. (In prep). Life Without Cortex.

Jiang, L., Li, W., Mamtilahun, M., Song, Y., Ma, Y., Qu, M., Lu, Y., He, X., **Zheng, J.** . . . Wang, Y. (2017). Optogenetic Inhibition of Striatal GABAergic Neuronal Activity Improves Outcomes After Ischemic Brain Injury. *Stroke, 48*(12), 3375-3383.

Bracko, O., Cruz, J., N. Njiru, B., Swallow, M., **Zheng, J.**, Ali, M., … Schaffer, C. (2018). Stalled Blood Flow in Brain Capillaries Is Responsible for Reduced Cortical Perfusion and Impacts Cognitive Function in Mouse Models of Alzheimer's Disease. *Alzheimer's & Dementia*, *14*, P651–P652.

Bracko, O., Cruz, J., K. Vinarcsik, L., Ali, M., Swallow, M., **Zheng, J.**, … Schaffer, C. (2018). High Fat Diet Exacerbates Capillary Stalling in Alzheimer's Disease-related Pathology in the APP/PS1 Mice Model. *Alzheimer's & Dementia*, *14*, P749–P750.