

YOU (LILIAN) CHENG

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AREA OF RESEARCH

Human Navigation, Brain-Inspired Computing, Computational Neuroscience, Neuroimaging

EDUCATION

Ph.D. Candidate, Cognitive Neuroscience <i>University of California, Irvine (UCI), Irvine, CA, USA</i>	Sept. 2019 – Present
M.S., Cognitive Neuroscience <i>University of California, Irvine (UCI), Irvine, CA, USA</i>	Dec. 2020
M.A., Geography <i>University of California, Santa Barbara (UCSB), Santa Barbara, CA, USA</i>	Sept. 2019
B.S., Psychology <i>South China Normal University (SCNU), Guangzhou, Guangdong, China</i>	June 2014

GRANTS & FELLOWSHIPS

- 2021 Cascade Mentoring Fellowship (\$6,000). *School of Social Sciences, UCI*
- 2020 Social Sciences Instructional Fellowship (\$2,500). *School of Social Sciences, UCI*
- 2019 Methods U at UCSB Scholarship (\$200). *Graduate Division, UCSB*
- 2019 Crossroads Fellow (\$8,000). *UCSB*
- 2018 Summer Research Fund (\$2,400). *Department of Geography, UCSB*
- 2014 Zhang Wenjin Fellowship (\$400). *SCNU*
- “The influence of time perception on time-based prospective memory.” PI (Co-PI, Yinxin Liang) National Undergraduate Training Program for Innovation and Entrepreneurship Grant No. 201210574079, 2/16/12 - 2/16/13 (\$1,000). *Ministry of Education of the People’s Republic of China*
- “The mechanism of mixed-prospective memory.” Co-PI (PI, Yinxin Liang), University Undergraduate Training Program for Innovation and Entrepreneurship Grant 3/15/12 - 3/15/13 (\$200). *SCNU*

AWARDS & HONORS

- 2021 Roger W. Russell Scholar’s Award. *Center for the Neurobiology of Learning and Memory (CNLM), UCI*
- 2021 Audience Choice Award. *Associated Graduate Students (AGS) Virtual Symposium, UCI*
- 2021 1st Place Winner of the Business Pitch Competition. *GPS STEM & Beall Applied Innovation, UCI*
- 2021 AGS Virtual Conference Grant Award. *Graduate Division, UCI*
- 2020 Trainee Professional Development Award (TPDA). *Society for Neuroscience*
- 2020 Finalist in AI4Good 2020 Hackathon. *TECHAiDE*
- 2020 Runner-Up in WaiDATATHON for Sustainable Future. *WaiACCELERATE & Women in AI (WAI)*
- 2018 Graduate Students Association Conference Travel Award. *Graduate Division, UCSB*
- 2018 Jack & Laura Dangermond Travel Scholarship Award (twice). *Department of Geography, UCSB*
- 2017 Jack & Laura Dangermond Travel Scholarship Award. *Department of Geography, UCSB*
- 2015 Marie A. Center Memorial Travel Award. *Dartmouth College*
- 2015 Neukom Travel Award. *Dartmouth College*
- 2013 Excellent Student in Academic Research. *School of Psychology, SCNU*
- 2012 Excellent Student in Social Activities. *School of Psychology, SCNU*
- 2011 Third Prize in Chinese Calligraphy Contest. *SCNU*
- 2010 Excellent Award in Special Investigation Competition. *SCNU*

PRE-PRINT PUBLICATIONS

- 't Hart, B. M., Achakulvisut, T., Blohm, G., Kording, K., Peters, M. A. K., Akrami, A., ... Hyafil, A. (2021, February 15). Neuromatch Academy: a 3-week, online summer school in computational neuroscience. *OSF preprint* <https://doi.org/10.31219/osf.io/9fp4v> pdf

REFEREED PUBLICATIONS

- Chrastil, E. R., **Cheng, Y.**. Central Coordination and Integration of Diverse Information to Form a Single Map. In R. D. Montello & K. M. Curtin (Eds.), *Collective Spatial Cognition: A Research Agenda*. Routledge (Taylor and Francis). (*in press*)
- **Cheng, Y.**, Hegarty, M., Chrastil, E. R. (2020). Telling right from right: the influence of handedness in the mental rotation of hands. *Cognitive Research: Principles and Implications*, 5, 1-18. pdf
- Sun, L., Tan, P. *, **Cheng, Y. ***, Chen, J., Qu, C. (2015). The effect of altruistic tendency on fairness in third-party punishment. *Frontiers in psychology*, 6, 820. *denotes equal authorship pdf
- Qu, L., Dou, W., **Cheng, Y.**, Qu, C. (2014). The processing course of conflicts in third-party punishment: An event-related potential study. *PsyCh journal*, 3(3), 214-221. pdf

MANUSCRIPTS IN PREP AND UNDER REVIEW

- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. (*in preparation*)

REVIEW

Ad Hoc Journal Referee

- Quarterly Journal of Experimental Psychology

Conference Proposal Referee

- 2021 Grace Hopper Celebration of Women in Computing (vGHC) - Proposals for Workshops and Presentations in the Data Science Track

Application Review

- Neuromatch Academy 2021 - Computational Neuroscience Student Application

Curricular Review

- Neuromatch Academy 2021 - Computational Neuroscience Tutorials (Model Types, Machine Learning, Reinforcement Learning, Deep Learning, Neuroscience Refresher Introduction)
- Neuromatch Academy 2021 - Deep Learning Tutorials (Parameter Sharing: ConvNets and RNNs, Modern RNNs, Attention and Transformers, Reinforcement Learning Basics)
- Coursera Guided Project (3D SARS-CoV-19 Protein Visualization With Biopython)

SELECT CONFERENCE PRESENTATIONS

Oral Presentations

- **Cheng, Y.**, Chrastil, E.R.. Head Direction Signals During Navigation. *Virtual Spring CNLM Conference - Memory: It's About Time, Virtual. May, 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *UCI Associated Graduate Students (AGS) Symposium, Virtual. April, 2021. Audience Choice Award.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. *Neuromatch Conference 3.0, Virtual. Oct., 2020.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. *Interdisciplinary Navigation Symposium (iNAV), Virtual. Oct., 2020.*
- **Cheng, Y.**. Travel Direction as a Fundamental Component of Human Navigation. *UCI Cognitive Sciences Department Graduate Student Presentation Bonanza, Irvine. Jan., 2020.*
- **Cheng, Y.**. What Are the Sex Differences in Navigation Training? Using the Sea Hero Quest Dataset. *UCSB Crossroads Symposium, Santa Barbara. Nov., 2019.*
- Downs, M., Davis, F., Brun, J., Huang, T., **Cheng, Y.**. Greater Than the Sum of the Parts: Collaboration in the U.S. LTER Network. *International Long-Term Ecosystem Research Open Science Meeting (ILTER OSM), Leipzig, Germany. Sept., 2019.*

- **Cheng, Y.** Domain-General Distance Representation. *Spring Quarter UCSB Geography Department Colloquium, Santa Barbara. May, 2019.*
- **Cheng, Y.**, Chrastil, E.R.. From Individual Cognitive Maps to a Collective Cognitive Map: Prescriptive Guidelines. *Collective Spatial Cognition Specialist Meeting, Santa Barbara. April, 2019.*
- **Cheng, Y.** Left Hand, Right Hand. *2018 Spatial Lightning Talks, UCSB Center for Spatial Studies. University of California, Santa Barbara. Feb 9, 2018.*
- **Cheng, Y.**, Liang, Y., Tang, Z.. Mixed Time-Based and Event-Based Prospective Memory: A Behavioral Study. *the 16th National Academic Congress of Psychology, Nanjing, China. Nov., 2013.*

Poster Presentations

- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in a Complex Environment. *Annual Meeting of the Organization for Human Brain Mapping (OHBM), Virtual. June, 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *spatial@ucsb.global2021: Spatial Data Science for a Sustainable Future, Virtual. June, 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *Cognitive Neuroscience Society (CNS) Annual Meeting, Virtual. March, 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *Interdepartmental Neuroscience Program (INP) recruitment session, Virtual. Jan., 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *Society for Neuroscience Global Connectome, Virtual. Jan., 2021.*
- **Cheng, Y.**, Chrastil, E.R.. The Emergence of Head Direction Signals in Human Navigation. *Psychonomic Society Annual Meeting, Virtual. Nov., 2020.*
- Downs, M., Brun, J., Huang, T., **Cheng, Y.** Greater Than the Sum of the Parts: Collaboration in and Beyond the U.S. LTER Network. *Ecological Society of America Annual Meeting, Virtual. Aug., 2020.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. *Interdepartmental Neuroscience Program (INP) recruitment session, Irvine. Jan., 2020.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. *Psychonomic Society Annual Meeting, Montreal, Canada. Nov., 2019.*
- **Cheng, Y.**, Hegarty, M., Chrastil, E.R.. Embodied Experience of the ‘Wrong’ Hand, Not World Knowledge, Supports the Mental Rotation of Hands. *Psychonomic Society Annual Meeting, New Orleans, USA. Nov., 2018.*
- **Cheng, Y.**, Hegarty, M., Chrastil, E.R.. Performance Discrepancy Between Left-handers and Right-handers Reveals Multisensory Integration in the Mental Rotation of Hands. *Spatial Cognition, Tübingen, Germany. Aug., 2018.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. *Interdisciplinary Navigation Symposium (iNAV), Quebec, Canada. June, 2018.*
- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Are You Getting Closer to the Sun or to the Moon? An Unusual Motion Adaptation Effect of Travel Direction. *spatial@ucsb.local2018, UCSB Center for Spatial Studies. University of California, Santa Barbara. June, 2018.*
- Chrastil, E.R., Nicora, G., Davis, R., Smith, J., **Cheng, Y.** The Influence of Decision-Making on Spatial Learning and Memory: An Individual Differences Approach. *Society for Neuroscience Annual Meeting, Washington DC, USA. Nov., 2017.*
- **Cheng, Y.**, Qu, C.. Cost Consideration Driven by Prosociality in Third-party Punishment: Using Feedback Related Negativity. *Society for Neuroscience Annual Meeting, Chicago, USA. Oct., 2015.*

RESEARCH EXPERIENCE

Graduate Student Researcher <i>Cognitive Anteaater Robotics Lab, UCI</i>	Jan. 2021 – Present <i>Irvine, CA</i>
<ul style="list-style-type: none"> • Study the artificial neural network of travel direction system in the human brain • Utilize computational modeling and virtual robot simulation 	
Graduate Student Researcher <i>Spatial Neuroscience Lab, UCSB & UCI</i>	July 2017 – Present <i>Santa Barbara, CA & Irvine, CA</i>
<ul style="list-style-type: none"> • Study the biological neural network of travel direction system in the human brain • Utilize psychophysics, virtual reality, and fMRI 	
Graduate Student Researcher <i>Social Perception Lab, Dartmouth College</i>	Sept. 2014 – July 2016 <i>Hanover, NH</i>
<ul style="list-style-type: none"> • Researched the face recognition system in the human brain 	

MEDIA COVERAGE

- Research on sex differences in navigation featured in "UCSB Crossroads," *2019/20 UCSB Graduate Division Magazine* p.45 (11/15/19)

UNIVERSITY TEACHING EXPERIENCE

Curriculum Development & Instructional Materials

- Developed a website "*Building your teaching styles*" to help college TAs/Instructors build teaching styles
- Developed a teaching video "*Sex Differences in Navigation from a Human Geographer's Perspective*" (for undergraduate psychology, geography, neuroscience, and anthropology courses)

Instructor of Record

Summer 2021

"*Psychology Fundamentals*", UCI

Remote

- Design the content structure, assignments, discussions, exams, grading metrics, and supervise TA activities
- Give accumulated 4.5 h-long weekly lectures to 50 undergraduate students on in-depth general psychology topics, including learning, memory, motivation, thought processes, emotion, language, and development

Social Sciences Instructional Fellow

Summer 2020

School of Social Sciences, UCI

Irvine, CA

- Trained in online teaching through UCI Division of Teaching Excellence and Innovation
- Assisted 1 professor in School of Social Sciences in addressing some of the challenges in transitioning to emergency remote teaching

Teaching Assistant

Fall 2017 – Spring 2018

"*Human, Place and Space*", UCSB

Santa Barbara, CA

- Prepared and delivered interactive lectures that blended scholarly research, critical thinking, and global trend
- Led structured group discussions of over 70 students, advised diverse student population on assignments, helped students grasp challenging course material

Teaching Assistant

Spring 2016

"*Cognition*", Dartmouth College

Hanover, NH

- Advised diverse student population on assignments, helped students grasp challenging course material
- Assisted guest lecturer with conducting hypnosis on volunteered students in class

MENTORING

UCI

Winter 2020 – Present

Graduate Division Graduate InterConnect (GIC) Program Peer Mentor & CNLM

Irvine, CA

- Provide guidance to first-year international graduate students in acclimate to UCI
- Supervised 4 high school students from all over the U.S. in learning research methods and making research presentations through reading journal articles related to learning and memory over 8 weeks
- Supervised 3 high school students in preparing for annual Irvine Brain Bee

Other Universities (City University of New York)

Fall 2020

Cientifico Latino's Graduate Student Mentorship Initiative (GSMI)

Remote

- Guided 1 underrepresented undergraduate student in applying for graduate program in neuroscience

UCSB

Winter 2018 – Summer 2018

Summer Research Mentorship Program (RMP) & Women in STEM Mentorship Program

Santa Barbara, CA

- Supervised 1 undergraduate in setting goals and making quarterly plans for undergraduate research
- Supervised 1 high school student in fMRI data analysis, oral presentations, and academic writing

LEADERSHIP & OUTREACH

Ambassador Program Adult Outreach Committee Co-Chair

Oct. 2019 – Present

UCI Center for Neurobiology of Learning and Memory (CNLM)

Irvine, CA

- Host panels on "sleep and mental health" and "addiction and mental health" toward Irvine adult community
- Promote "Health and Education" lectures on aging, lifestyle, and the brain toward Irvine senior community

Augmented Reality Sandbox Operator

Jan. 2019 – Sept. 2019

Department of Geography, UCSB

Santa Barbara, CA

- Displayed augmented reality sandbox during departmental outreach events to a various of audience including k-12 students, undergraduate students and their parents, graduate students, and faculty

Geography Outreach Group Member

Sept. 2017 – Sept. 2019

Department of Geography, UCSB

Santa Barbara, CA

- Organized Geography Awareness Week: connect graduate students and professors from UCSB to give geography-related lectures to local K-12 schools
- Organized geography outreach classes on remote sensing at Tech Savvy: teaching girls in grades six through nine to explore STEM education and related careers
- Promoted Annual Geography Trivia Night

RELEVANT INTERNSHIPS

Data Science Instructor for Guided Projects

Aug. 2020 – Present

Coursera Inc.

Remote

- Create hands-on data science courses in R and Python with global learners
- Published data science instructor on Coursera *You (Lilian) Cheng*

Teaching Assistant

June 2020 – July 2020

Neuromatch Academy Inc. - a worldwide online computational neuroscience summer school

Remote

- Provided feedback to evaluate and improve course material as a pre-pod member
- Taught 10 students across the world online about applying computational methods (e.g., general linear model, dimensionality reduction, dynamic systems, etc.) to neuroscience research using python

Data Science Intern

June 2019 – Sept. 2019

National Center for Ecological Analysis and Synthesis (NCEAS)

Santa Barbara, CA

- Conducted network analyses on publication and citation over 4 decades in 28 national research sites by extracting data from API (crossref) using R and Python
- Hosted 3 workshops to diverse groups on learning newly developed R functions

Instructor in Psychology

Sept. 2013 – Nov. 2013

Guangzhou 10th Middle School

Guangzhou, China

- Taught psychology to two eighth-grade classes
- Counseled middle school students on issues on anxiety and high school entrance examination
- Organized Psychology Activity Month, including two group training for students from seventh and eighth grades

RELEVANT SKILLS

Quantitative Skills: Mathematical Statistics & Probability, Psychology Measurement & Statistics, Big Data Analysis, Discrete Mathematics, Machine Learning, Neural Networks, Linear Algebra, Time Series, Spatial Analysis, Network Analysis, Cognitive Robotics, Statistics in fMRI Data Analysis, Text Mining, Reinforcement Learning

Brain Analysis Technology: fMRI (FSL, AFNI, SPM, Jupyter Notebook), ERP (Brain Voyager), tDCS

Robot Simulation Technology: Webots (Python, MATLAB, C)

Virtual Reality Technology: World Vizard, Sketch Up, Blender, 3D Max

Spatial Analysis Technology: ArcGIS

Web Design Skills: Wordpress, Drupal, CSS, R, Jupyter Notebook, Github

Online Teaching Skills: Zoom, Yuja, Rhyme

Programming Skills: Python, Spark (SparkR, PySpark), MATLAB, R, SQL, SDL (Presentation), E-Basic (E-Prime), PsychoPy, LaTeX

Statistics Skills: R, SPSS

Language Skills: Mandarin (native), English (fluent), Cantonese (conversational), Spanish (entry)

SELECT TRAININGS & CERTIFICATIONS

Modeling & Computing

2021 Neurohackademy Summer School. *eScience Institute, University of Washington*

2021 Digital Scholarship Services Version Control with Git Workshop and Certification. *Virtual, UCI Library*

2021 Digital Scholarship Services Unix Workshop and Certification. *Virtual, UCI Library*

2020 3rd Robot Learning Workshop: Grounding Machine Learning Development in the Real World. *Virtual, Conference on Neural Information Processing Systems (NeurIPS)*

2020 Spiking Neural Networks Workshop, “Spiking Neural Networks as Universal Function Approximators: Learning Algorithms and Applications”. *Virtual, Dan Goodman & Friedemann Zenke*

Data Science & Statistics

2020 Visualizing Science with Ramin Rahni, PhD - Boot Camp and Certification. *Virtual, Biosci & GPS-STEM, UCI*

2020 Data Science Workshop, “Data Science for Social Good (DS4SG)”. *Virtual, Georgia Tech Univ.*

2020 Statistics Workshop, “Beyond Statistical Significance: Finding Meaningful Effects”. *Virtual, NIH*

2019 Statistics Summer School, Methods University. *UCSB*

2018 Statistics Summer School, Methods University. *UCSB*

2018 Statistics Workshop, “Bren Quantitative Workshop”. *UCSB*

Public Speaking & Science Communication

2021 Communicating Science Conference for Graduate Students (ComSciCon). *Virtual, ComSciCon-LA*

2021 Industry Insights for STEM Scientists Program and Certification. *Virtual, UCI-GPS STEM*

2020 Public Speaking Program and Certification by Activate to Captivate. *Virtual, Graduate Division, UCI*

2020 Science Communication Skills for STEM Scientists - Boot Camp. *Virtual, UCI-GPS STEM*

2020 Science Communication Workshop, “The Fundamentals of SciComm”. *Virtual, Scientistt Team*

Psychology & Neuroscience

2020 Oxford Autumn School in Neuroscience. *Virtual, University of Oxford*

2019 Object Perception, Attention, and Memory Anniversary Workshop. *Montreal, Quebec, Canada*

2018 Object Perception, Attention, and Memory Anniversary Workshop. *New Orleans, LA, USA*

2013 Psychology Summer School. *Department of Psychology, Peking University (1 of 37 selected nationally)*

2013 Psychology Summer School. *Institute of Psychology, Chinese Academy of Sciences (1 of 50 selected nationally) (Declined)*

Virtual Reality

2018 Virtual Reality Workshop, “Virtual Environments as Geo/Spatial Labs”. *Tübingen, Germany*

2018 Virtual Reality Workshop, “Spatial Navigation Interfaces for Immersive Environments”. *Tübingen, Germany*

Academic

2021 Cascading Mentorship Certificate. *School of Social Sciences, UCI*

2021 Improv for Teaching Program and Certification by Activate to Captivate. *Graduate Division, UCI*

2020 Focus on Peer Review Certificate. *Nature Masterclasses*

2020 Mentoring Excellence Certificate. *UCI Graduate Division*

2020 Course Design Certificate. *UCI Division of Teaching Excellence and Innovation*

2020 Teaching Assistant Certificate. *Neuromatch Academy*

2014 Chinese Teacher’s License (Psychology and Education). *South China Normal University*

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Sciences (AAAS)	2020
Cognitive Neuroscience Society	2020
Orange County R Users Group (OCRUG)	2020
Women in AI (WAI)	2020
Women in Machine Learning (WiML)	2020
R-Ladies Global	2020
Woman Techmakers	2020
UCI Graduate Professional Success in STEM (GPS-STEM)	2020
UCI Center for the Neurobiology of Learning & Memory (CNLM)	2019
Women in Cognitive Science (WiCS)	2018
Psychonomic Society	2018
R-Ladies Santa Barbara	2018
Society for Neuroscience	2015
Vision Science Society	2015