

# YOU (LILIAN) CHENG

[youc3@uci.edu](mailto:youc3@uci.edu) | [Linkedin](#) | [Github](#) | [Website](#)

## EDUCATION

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

## GRANTS & FELLOWSHIPS

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- 2020 Social Sciences Instructional Fellowship. *School of Social Sciences, UCI*
- 2019 Methods U at UCSB Scholarship. *Graduate Division, UCSB*
- 2019 Crossroads Fellow. *UCSB (Featured in 2019/20 UCSB Graduate Division Magazine page 45)*
- 2018 Summer Research Fund. *Department of Geography, UCSB*
- 2014 Recipient, Senior thesis project funded by the National Base of Psychology Research Program, for a study on how altered auditory stimuli influence the Ponzo illusion in different directions. *SCNU*
- 2014 Zhang Wenjin Fellowship. *SCNU*
- 2012 Recipient, “National University Student Innovation Program” National-level Grant (\$1000), for a study on the influence of time perception on time-based prospective memory. *Ministry of Education of the People’s Republic of China*
- 2012 Recipient, “National University Student Innovation Program” University-level Grant (\$200), for a study on the mechanism of mixed-prospective memory. *SCNU*
- 2011 Recipient, Junior project funded by the National Base of Psychology Research Program, for a study on the moderate effect of psychological capital in the relationship between Chinese undergraduates’ belief in a just world and subjective well-being. *SCNU*
- 2010 Recipient, Junior project funded by the Neuroeconomics Lab, for a study on different attitudes toward dictators and victims in the third-party punishment. *SCNU*

## AWARDS & HONORS

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- 2020 Trainee Professional Development Award (TPDA). *Society for Neuroscience*
- 2020 Finalist in AI4Good 2020 Hackathon. *TECHAiDE*
- 2020 2nd Place in WaiDATATHON for Sustainable Future. *WaiACCELERATE & Women in AI (WAI)*
- 2018 Graduate Students Association Conference Travel Award. *Department of Geography, UCSB*
- 2017 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*

## PEER-REVIEWED PUBLICATIONS

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- **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.
- 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
- 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.

## MANUSCRIPTS IN PREP AND UNDER REVIEW

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- **Cheng, Y.**, Ling, S., Stern, C. E., Huang, A., Chrastil, E.R.. Travel Direction as a Fundamental Component of Human Navigation. (*in preparation*)
- Chrastil, E. R., **Cheng, Y.**. Central Coordination and Integration of Diverse Information to Form a Single Map. Book Chapter. (*under 3rd round review*)

## SELECT CONFERENCE PRESENTATIONS

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### Oral Presentations

- **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 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.*
- Xiao, H., **Cheng, Y.**, Chen, L.. Correlation Study about View in a Just World and Subjective Well-being: The Moderate Effect of Psychological Capital-Chinese Undergraduates. *International Conference on Advanced Management Science and Information Engineering, Hongkong, China. Dec., 2014.*

## RESEARCH EXPERIENCE

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### Graduate Student Researcher

July 2017 – Present

*Spatial Neuroscience Lab, UCSB & UCI*

*Santa Barbara, CA & Irvine, CA*

- Utilize Jupyter Notebook for fMRI data analysis and Vizard software for virtual reality data collection
- Design, develop, and conduct multiple projects on human navigation and mental rotation using psychophysics, neuroimaging, virtual reality, and computational models
- Map and research spatial abilities from the small scale of neural coding to the vista scale of visual motion perception, spatial disorientation, to the large scale of behavior in environments
- Analyze and interpret individual differences in spatial abilities from “nature” impacts of sex and handedness, to “nurture” impacts of strategy and aging, as well as to a broader impact of society from human evolution perspective

### Graduate Student Researcher

Sept. 2014 – July 2016

*Social Perception Lab, Dartmouth College*

*Hanover, NH*

- Utilized AFNI software for fMRI data analysis and transcranial current stimulation for data collection
- Designed and implemented an experiment on 85 subjects to investigate how the ability to remember faces can be improved by transcranial current stimulation (tDCS)
- Conducted multiple designed and programmed projects on face recognition and object recognition
- Developed and programmed 4 recognition tests, 2 prime tests, 2 Stroop tests, 5 quadrant tests, and 5 dual tests, recruited and tested over 200 subjects including 3 patients with acquired prosopagnosia
- Established a fine-grained series of visual cognition tests for preliminary identification of the brain region leading to prosopagnosia, as well as two parallel series of tests that dissociated face recognition from animal recognition

### Undergraduate Research Assistant

Nov. 2012 – June 2014

*Visual and Auditory Cognition Lab, SCNU*

*Gunagzhou, China*

- Wrote senior thesis funded by the National Base of Psychology Research Program
- Designed, programmed, and implemented a project investigating how altered auditory stimuli influence the Ponzo illusion in different directions
- Researched the Colavita visual dominance effect in an audiovisual experiment

### Undergraduate Research Assistant & Lab Manager

Oct. 2010 – June 2014

*Neuroeconomics Lab, SCNU*

*Gunagzhou, China*

- Selected to manage the lab for two years, including managing group members' research plans, establishing project benchmarks, and applying reimbursement for research expenditures
- Used Brain Product for Event-related Potential (ERP) data collection and data analysis
- Independently recruited over 30 subjects to collect data for two ERP studies
- Devised, computed, and implemented a decision-making game to investigate peoples' different attitudes toward dictators and victims

## UNIVERSITY TEACHING EXPERIENCE

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### Curriculum Development & Instructional Materials

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

### 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 exercises, 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

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### Mentor

Fall 2020

*Científico Latino’s Graduate Student Mentorship Initiative (GSMI)*

*Remote*

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

### Mentor

Winter 2020 – Summer 2020

*UCI*

*Irvine, CA*

- 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

### Mentor

Winter 2018 – Summer 2018

*UCSB*

*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

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### Ambassador Program Adult Committee Co-chair

Oct. 2019 – Present

*UCI Center for Neurobiology of Learning and Memory (CNLM)*

*Irvine, CA*

- Host outreach and educational activities to advance public understanding of brain science
- Promote annual Irvine Brain Bee event

### 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

### 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

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### 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 feedbacks 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

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**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, Bayesian Statistics

**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, 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)

### Training

- 2021 Neurohackademy Summer School. *eScience Institute, University of Washington (selected for 2020 cohort, deferred to 2021 summer due to Covid-19)*
- 2020 3rd Robot Learning Workshop: Grounding Machine Learning Development in the Real World. *Virtual, Conference on Neural Information Processing Systems (NeurIPS)*
- 2020 Data Science Workshop, “Data Science for Social Good (DS4SG)”. *Virtual, Georgia Tech Univ.*
- 2020 Science Communication Skills for STEM Scientists - BootCamp. *Virtual, UCI-GPS STEM*
- 2020 Oxford Autumn School in Neuroscience. *Virtual, University of Oxford*
- 2020 Statistics Workshop, “Beyond Statistical Significance: Finding Meaningful Effects”. *Virtual, National Institute of Health*
- 2020 Spiking Neural Networks Workshop, “Spiking Neural Networks as Universal Function Approximators: Learning Algorithms and Applications”. *Virtual, Dan Goodman & Friedemann Zenke*
- 2020 Science Communication Workshop, “The Fundamentals of SciComm”. *Virtual, Scientistt Team*
- 2019 Object Perception, Attention, and Memory Anniversary Workshop. *Montreal, Quebec, Canada*
- 2019 Statistics Summer School, Methods University. *UCSB*
- 2018 Statistics Summer School, Methods University. *UCSB*
- 2018 Virtual Reality Workshop, “Spatial Navigation Interfaces for Immersive Environments”. *Tübingen, Germany*
- 2018 Virtual Reality Workshop, “Virtual Environments as Geo/Spatial Labs”. *Tübingen, Germany*
- 2018 Statistics Workshop, “Bren Quantitative Workshop”. *UCSB*
- 2018 Object Perception, Attention, and Memory Anniversary Workshop. *New Orleans, LA, USA*
- 2013 Psychology Summer School. *Department of Psychology, Peking University (1 of 50 selected nationally)*
- 2013 Psychology Summer School. *Institute of Psychology, Chinese Academy of Sciences (1 of 50 selected nationally) (Declined)*

## PROFESSIONAL MEMBERSHIPS

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| 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 |

## RELEVANT CERTIFICATES

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|---|------|
| Nature Masterclasses Focus on Peer Review Certificate | 2020 |
| UCI Mentoring Excellence Certificate                  | 2020 |
| UCI Course Design Certificate                         | 2020 |
| Neuromatch Academy Teaching Assistant Certificate     | 2020 |
| Chinese Teacher's License (Psychology and Education)  | 2014 |