YOU (LILIAN) CHENG

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AREA OF RESEARCH

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

EDUCATION

Ph.D. Candidate, Cognitive Neuroscience — Sept. 2019 – Present
University of California, Irvine (UCI), Irvine, CA, USA

M.S., Cognitive Neuroscience — Oct. 2020
University of California, Irvine (UCI), Irvine, CA, USA

M.A., Geography — Sept. 2019
University of California, Santa Barbara (UCSB), Santa Barbara, CA, USA

B.S., Psychology — June 2014
South China Normal University (SCNU), Guangzhou, Guangdong, China

GRANTS & FELLOWSHIPS

- 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. *Chinese Ministry of Education*
- 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

- 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. *Department of Geography, 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*

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

- **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*)

- Chrastil, E. R., **Cheng, Y.**. Central Coordination and Integration of Diverse Information to Form a Single Map. Book Chapter. (*under 3rd round review*)

Review

Ad Hoc Journal Referee
- Quarterly Journal of Experimental Psychology

Select Conference Presentations

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. *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.*
- 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

Graduate Student Researcher   Jan. 2021 – Present
Cognitive Anteater Robotics Lab, UCI   *Irvine, CA*
- Utilize Matlab for building computational neuroscience models and Webots software for virtual robots simulation
- Build computational models of human path integration using recurrent neural networks
- Test spatial cognition theories by simulating neuromodulation system of virtual robots with reinforcement learning

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, and 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 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
- 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

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)

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

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

Ambassador Program Adult Outreach 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

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, Bayesian Statistics, 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, 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

Modeling & Computing

- 2021 Neurohackademy Summer School. *eScience Institute, University of Washington (selected for 2020 cohort, deferred to 2021 summer due to Covid-19)*
- 2021 Digital Scholarship Services Version Control with Git Workshop. *Virtual, UCI Library*
- 2021 Digital Scholarship Services Unix Workshop. *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. *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

- 2020 Public Speaking Program 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 50 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*

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

Relevant Certificates

Unix Shell Badge	UCI Division of Continuing Education 2021
Focus on Peer Review Certificate	Nature Masterclasses 2020
Public Speaking Certificate	UCI Graduate Division 2020
Mentoring Excellence Certificate	UCI Graduate Division 2020
Course Design Certificate	UCI Division of Teaching Excellence and Innovation 2020
Teaching Assistant Certificate	Neuromatch Academy 2020
Chinese Teacher's License (Psychology and Education)	South China Normal University 2014