HUA XIE

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EDUCATION

University of California, Irvine, CA
Ph.D. Candidate in Mathematical, Computational, and Systems Biology anticipated 2021
M.S. Mathematical, Computational, and Systems Biology 2018

Northwestern University, Evanston, IL
B.S. Biological Sciences (Neurobiology Concentration) and Radio/Television/Film 2012

BROAD RESEARCH AND CAREER INTERESTS

Probabilistic numerics (Bayesian statistical inference on differential equation models), probabilistic programming and machine learning, environmental informatics, terrestrial biogeochemistry, agriculture statistics and data science, and entertainment statistics and data science

RESEARCH AND WORK EXPERIENCE

University of California 09/2015 - present
Mathematical, Computational, and Systems Biology PhD Student *Irvine, CA*

- Advised by Dr. Steven Allison.
- Assessing the predictive accuracy and validity of differential equation Earth system and soil biogeochemical models using Bayesian and frequentist statistical inference techniques.
- Compiling and cleaning data sets from longitudinal soil experiments using R and Julia packages to create data products ready for analysis.
- Assembling model-data assimilation frameworks for testing the predictive accuracy of soil biogeochemical models conditional on aforementioned experimental results using R and Stan.
- Investigating the effect of global warming on tropical rainforest soils as part of the multi-institution Tropical Responses to Altered Climate Experiment (TRACE) research output with mathematical and statistical modeling.
- Mentoring undergraduate and junior graduate students to promote data and statistical proficiency of research group.

Qchain Co. 03/2017 - 02/2020
Chief Executive Officer *Irvine, CA*

- Fundraised $800,000 from venture capital and crowdfunding to build a branded content marketplace that connected advertisers and marketers to influencers and content creators.
- Led business development, investor pitching, product marketing, content writing, social media management, human resources, legal compliance, and financial operations efforts.
- Managed up to 12 employees across operations and technology development teams.
- Studied U.S. federal and state tax codes to complete intricate corporate tax returns.

- Contributed Javascript code to help build a responsive and mobile-friendly Jekyll website for Qchain's homepage.
- Contributed to Javascript coding and deployment of the marketplace application.
- Transferred Qchain intellectual property to Singaporean holding company Ad360 in March of 2019 before engaging in wrap-up process to conclude U.S. operations.

National Institutes of Health 10/2013 - 07/2015
Post-baccalaureate Research Fellow *Bethesda, MD*

- Advised by Dr. Carson Chow and Dr. Shashaank Vattikuti.
- Investigated neural phenomenon of divisive normalization using biologically realistic spiking neural networks.
- Coded mathematical models of spiking neuron populations using numerical and scientific computing tools in Python, Julia, R, C++, and XPP.
- Coded parallelized Markov chain Monte Carlo statistical learning algorithms running on computing clusters to fit neural network models to experimental data.
- Assisted in the coding and conducting of visual psychophysics experiments.

Sprout Social 08/2012 - 09/2013
Digital Marketing Analyst *Chicago, IL*

- Managed day-to-day execution of Sprout Social's search engine optimization strategy using analytics tools such as Google Analytics, Google Webmaster Tools, and Moz.
- Introduced to software development and data analytics through collaborative projects with engineers.
- Analyzed web traffic and email marketing data and plotted and reported results using R.

PEER-REVIEWED RESEARCH PUBLICATIONS

Xie, H.W., Romero-Olivares, A.L., Guindani, M., and Allison, S.D. 2020. "A Bayesian approach to evaluation of soil biogeochemical models." *Biogeosciences.* 17:4043 - 4057.

Vattikuti, S., Thangaraj, P., **Xie, H.W.**, Gotts, S.J., Martin, A., and Chow, C.C. 2016. "Canonical cortical circuit model explains rivalry, intermittent rivalry, and rivalry memory." *PLoS Comput Bio.* 12:e1004903

ORAL PRESENTATIONS

Xie, H. W., and S. D. Allison. Dec 2018. "A Bayesian Approach to Soil Biogeochemical Model Comparison." Annual Meeting of the American Geophysical Union, Washington, DC.

POSTER PRESENTATIONS

Xie, H. W., A. L. Romero-Olivares, M. Guindani, and S. D. Allison. Dec 2017. "Bayesian Evaluation of Dynamical Soil Carbon Models Using Soil Carbon Flux Data." Annual Meeting of the American Geophysical Union, New Orleans, LA.

Xie, H. W., A. L. Romero-Olivares, M. Guindani, and S. D. Allison. Oct 2017. "Bayesian Evaluation of Soil Carbon Models." Global Soil Biodiversity Conference, Nanjing, China.

Espejo, S., **Xie, H. W.**, and S. D. Allison. Oct 2016. "Using temperature-based soil respiration models to compare the temperature sensitivity of seasonal soil respiration rates." HENAAC Conference, Anaheim.

ACADEMIC AWARDS AND FELLOWSHIPS

UCI Honorary Machine Learning and Physical Sciences Fellow, 2018 - 2019

National Institutes of Health Predoctoral T32 Training Award Fellowship, 2017 - 2019

National Science Foundation Graduate Research Fellowship Honorable Mention, 2016 and 2017

UCI Climate Action Training Fellowship, 2017 - 2018

UCI Mathematical, Computational, and Systems Biology Fellowship, 2015 - 2016

National Institutes of Health Intramural Research Training Award, 2013 - 2015

TEACHING EXPERIENCE

University of California
Teaching Assistant *Irvine, CA*

- Summer 2020: Teaching Assistant, Mathematical and Computational Biology Bootcamp
- Summer 2018: Teaching Assistant, Mathematical and Computational Biology Bootcamp
- Summer 2017: Teaching Assistant, Mathematical and Computational Biology Bootcamp
- Summer 2016: Teaching Assistant, Mathematical and Computational Biology Bootcamp

Northwestern University
Teaching Assistant *Evanston, IL*

- Summer 2012: Teaching Assistant, Biological Sciences 210-3: Cell Biology and Physiology
- Summer 2012: Teaching Assistant, Biological Sciences 210-2: Biochemistry and Molecular Biology
- Summer 2012: Teaching Assistant, Biological Sciences 210-1: Genetics and Evolutionary Biology

SKILLS

Programming languages: R (Shiny, Tidyverse, data.table), Python (Numpy, Scipy, Pandas), Julia, C++, Ruby, Javascript

Computational languages: Stan, Mathematica, MATLAB

Web design languages and frameworks: HTML, Markdown, Jekyll, Hugo, Gatsby

Tooling: LaTeX, Vim, XPPAUT, Adobe Creative Suite, Microsoft Office Suite

Human languages: English (native), Chinese (fluent), Spanish (conversational), Japanese (novice), Portuguese (novice)

REFERENCES

Dr. Steven D. Allison
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