Sam Lau

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Department of Cognitive Science
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Research Interests

Human-computer interaction, end-user programming, data science education, statistics education

Education

University of California, San Diego

Ph.D. Cognitive Science — 2018 – Present
Advisor: Philip Guo

University of California, Berkeley

M.S. Computer Science — 2017 – 2018
Advisor: Joshua Hug
GPA: 3.93

B.S. Electrical Engineering and Computer Science — 2013 – 2017
GPA: 3.96

Peer-Reviewed Publications

Conference Papers

[C.2] Sam Lau, Sruti Srinivasa Ragavan, Ken Milne, Titus Barik, Advait Sarkar. TweakIt: Supporting End-User Programmers Who Transmogrify Code. ACM Conference on Human Factors in Computing Systems (CHI), 2021.

Placing live previews of code outputs directly in spreadsheets enables data analysts to tweak and reuse Python examples without needing Python expertise.

[C.1] Sam Lau, Ian Drosos, Julia M. Markel, Philip J. Guo. The Design Space of Computational Notebooks: An Analysis of 60 Systems in Academia and Industry. IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2020.

Computational notebooks vary widely in data import, code editing, code execution, and output format.

Workshop and Poster Papers

[P.3] Sam Lau, Philip Guo. Data Theater: A Live Programming Environment for Prototyping Data-Driven Explorable Explanations. Workshop on Live Programming (LIVE), 2020

Separating logic from presentation simplifies the process of creating explorable explanations.

[P.2] Samuel Lau, Tricia J. Ngoon, Vineet Pandey, Scott Klemmer. Experiment Reconstruction Reduces Fixation on Surface Details of Explanations. Poster in Proceedings of C&C 2019: ACM SIGCHI Conference on Creativity and Cognition, 2019

Asking people to mentally replicate an experiment briefly reduces the allure of scientific terminology.

[P.1] Vinitra Swamy, Allen Guo, Samuel Lau, Wilton Wu, Madeline Wu, Zachary Pardos, David Culler. Deep Knowledge Tracing for Free-Form Student Code Progression. Poster in Proceedings of AIED 2018: *International Conference on Artificial Intelligence in Education*, June 2018

Deep learning models trained on free-form student code predict learning pace.

Journal Articles

[J.1] Shou-Tian Zheng, Xiang Zhao, Samuel Lau, Addis Fuhr, Pingyun Feng, Xianhui Bu. Entrapment of metal clusters in metal-organic framework channels by extended hooks anchored at open metal sites. In JACS: *Journal of the American Chemical Society*, 2013.

Books and Monographs

Textbooks

[B.1] Samuel Lau, Joseph Gonzalez, Deborah Nolan. Principles and Techniques of Data Science, 2018. `www.textbook.ds100.org`.

Used in required course for Data Science major and minor, serving 2,000 Berkeley students annually with an additional 30,000 readers from 145 countries.

Awards and Honors

UCSD Cognitive Science Teaching Excellence Award	2019
UC Berkeley EECS Distinguished Graduate Student Instructor Award	2018

Teaching Experience

Instructor

UCB Data 100: Principles and Techniques of Data Science Teaching rated 6.2 / 7.0 (dept avg 5.8), 92% response rate *First UCB summer offering of Data 100*	Summer 2019
UCB Data 8: Foundations of Data Science Teaching rated 6.3 / 7.0 (dept avg 5.8), 84% response rate *First UCB summer offering of Data 8*	Summer 2017

Graduate Teaching Assistant

UCSD COGS 10: Cognitive Consequences of Technology	Spring 2019
UCSD COGS 108: Data Science in Practice	Fall 2019, Winter 2019
UCB Data 100: Principles and Techniques of Data Science	Spring 2017, Fall 2017
UCB Data 8: Foundations of Data Science	Fall 2016, Spring 2016, Fall 2015
UCB CS 169: Software Engineering	Spring 2015

	UCB CS 61AS: Structure and Interpretation of Computer Programs	Spring 2014, Fall 2014

Other Employment and Projects

Berkeley Institute of Data Science, Berkeley, CA Student Research Engineer – designed distributed infrastructure for hosted computational notebooks. Architecture now used at multiple universities.	01/2017 - 06/2017
Counsyl, San Francisco, CA Software Engineering Intern – designed and built appointment scheduling web application.	05/2016 - 08/2016
Khan Academy, Mountain View, CA Software Engineering Intern – built article authoring system that non-programmers use to make interactive content. Now used for over 95% of articles on Khan Academy.	05/2015 - 08/2015
Berkeley Public Schools Fund, Berkeley, CA Software Engineering Intern – built crowdfunding system that raised over $66,000 for 20 Berkeley public schools.	08/2013 - 06/2014