Brooke K. Ryan

Website: brookekryan.com
Email: brooke.ryan@uci.edu
Google Scholar: Brooke K. Ryan
LinkedIn: brookekryan

EDUCATION

University of California, Irvine   Sept. 2020 – June 2022
M.S. in Computer Science, *3.82/4.0*   Irvine, CA

University of California, San Diego   Sept. 2013 – June 2017
B.S. in Mathematics & Computer Science   La Jolla, CA

RESEARCH INTERESTS

- Theoretical Neuroscience • Neural Networks • Cognitive Science • Psychology • Artificial Intelligence
- Statistics • Deep Learning • Machine Learning • Computational Linguistics • Computer Science Education

PUBLICATIONS

1. **Brooke Ryan**, Adriana Meza Soria, Kaj Dreef and André van der Hoek. 2022. Reading to Write Code: An Experience Report of a Reverse Engineering and Modeling Course. In *44nd International Conference on Software Engineering: Software Engineering Education and Training (ICSESEET '22), May 21–29, 2022, Pittsburgh, PA, USA.* ACM, New York, NY, USA, 12 pages. https://doi.org/10.1145/3510456.3514164

RESEARCH EXPERIENCE

Mattar Lab Researcher   Aug. 2022 – Present
Professor Marcelo Mattar, Professor of Cognitive Science   UC San Diego

- Researching computational models that predict human decisions and the deliberative processes underlying them. Lead student in exploratory project, investigating the use of neural networks as a mechanism for predicting and understanding individual and group decision-making.

Deep Learning Student Researcher   Mar. 2021 – Dec. 2021
Professor Pierre Baldi, Professor of Computer Science   UC Irvine

- Lead student in interdisciplinary research project with UCI Ophthalmology School investigating the parallels between machine and human vision using deep learning and human subject experiments.

- Contributed original insights and experiments to the project, including whether English literacy might superficially increase subjects' acuity recognition on the exams. Constructed series of experiments training models of neural networks and injecting "literacy" by providing additional training on the EMNIST dataset.

Edge Lab Student Researcher   Jan. 2022 – Present
Professor Faisal Nawab, Professor of Computer Science   UC Irvine

- Researched and implemented a novel Blockchain-based messaging system. Architecture utilizes NFTs for Identity system. Written in Solidity on the Ethereum ecosystem. Targeting mid-November submission.

Creativity Labs Student Researcher   Mar. 2022 – Present
Professor Kylie Peppler, Professor of Informatics and Education   UC Irvine

- Proposed original research project for AI-Generated art for promoting learning and inclusion in STEM, particularly for underrepresented groups. Targeting submission for Creativity and Cognition conference.

Graduate Student Researcher
Professor André van der Hoek, Professor of Informatics

Feb. 2021 – May 2022
UC Irvine

- Conducting research incorporating industrial Software Engineering experience to critically evaluate and develop new approaches to teaching CS. Focus on topics that are difficult to address in the classroom to enhance equity and accessibility to underrepresented groups.

- Implemented original curriculum using industry-acquired skills of synthesizing code in the context of large, existing software projects into a graduate-level course. Researched and wrote up techniques of leveraging existing source code to develop software for other universities wishing to implement a similar course.

SOFTWARE ENGINEERING EXPERIENCE

Associate Software Engineer
Blizzard Entertainment, *Battle.net and Online Products*

Jan. 2020 – Feb. 2021
Irvine, CA

- Backend Java engineer in the Battle.net and Online Products organization, delivering eCommerce APIs and capabilities on the Purchase team; additionally working in SQL and relational databases.

- Altered critical Purchase-system APIs to implement functionality to support several new payment methods and platforms in Korea region; co-presented an organization-wide talk on the project and methodologies used.

Software Engineer I
Intuit, *Core Technology Team*

Aug. 2017 – Nov. 2018
San Diego, CA

- Backend Java engineer; delivered Identity capabilities across Intuit products.

- Created Spring "Annotator" tool, automatically converts any Spring XML project to equivalent annotation configuration. Increases unit test speed 12x, provides business savings in reducing server runtime during test build. Gave organization-wide tech talk; open-sourcing for over 10,000 Intuit employees.

- Led Identity team to improve speed and stability of CICD test and build cycle. Researched strategies to address infrastructure issues, implemented automated build jobs for visibility on flaky tests. Decreased build by 1.5 hrs.

Software Engineering Intern
Intuit, *TurboTax Mobile Application Team*

June 2016 – Sept. 2016
San Diego, CA

- Intern on iOS TurboTax application team, focus in Java and React Native.

- Implemented Java HipTest integration project for TurboTax mobile front-end QE team. Improved visibility of manual tests by implementing interface for test data. Reduced time in manual testing by >40hr/ release.

Software Engineering Intern
CBS Interactive, *Advanced Technology Team*

June 2015 – Aug. 2015
San Francisco, CA

- Front-end software engineering intern on the Advanced Technology Team. Implemented several key features on the Content Management System JavaScript framework, increased efficiency with AJAX and MVC design.

TEACHING

Intermediate Programming (ICS 33)
Co-Lecturer & Teaching Assistant, *Professional Master of Software Engineering*

Summer 2022
UC Irvine

- Served as Co-Lecturer and teaching assistant for the second course in the introductory Computer Science courses at UC Irvine. Presented guest lecture on Programming in Industry, created tutorials hosted on my website.

Reverse Engineering and Modeling (SWE 265P)
Co-Lecturer & Teaching Assistant, *Professional Master of Software Engineering*

Spring 2022, Spring 2021
UC Irvine

- Served as Co-Lecturer and teaching assistant for professional graduate-level course. Created original course curriculum, presented lectures and tutorials, which are hosted on my website.

Programming Styles (SWE 262P)   Winter 2022, Winter 2021
Teaching Assistant, *Professional Master of Software Engineering*   UC Irvine

- Graduate professional course covering variety of programming styles and composition mechanisms. Held 5 hours of weekly mentoring, providing students with programming tools and techniques and professional advising.

Information Retrieval (CS 121)   Fall 2021
Teaching Assistant, *Department of Computer Science*   UC Irvine

- Facilitated discussion sections for over 75 students, and held 3 hours of office hours weekly. Developed custom educational materials from topics on the command line, development environments, documentation synthesis.

Project Management (INF 151)   Fall 2020
Teaching Assistant, *Department of Informatics*   UC Irvine

- Upper-division informatics course, provided hands-on advising to student teams focusing on technical projects.

Humanitarian Engineering (ENG 100L)   Fall 2015 – Spring 2017
Undergraduate Project Advisor, *Jacobs School of Engineering*   UC San Diego

- Advised machine learning/ computer vision Digital Vision Screening project to detect eye anomalies in children for UCSD Eye Mobile program. Finished 10yr legacy project in first year.

Design for Development (ENG 100D)   Fall 2015 – Spring 2017
Undergraduate Project Advisor, *Jacobs School of Engineering*   UC San Diego

- Advised hundreds of students in ongoing humanitarian software engineering projects for non-profit clients tied to UCSD startup community.

Multivariable Calculus (MATH 10C)   Spring 2014
Student Workshop Facilitator, *Office of Academic Support and Instructional Services*   UC San Diego

- Facilitated Multivariable Calculus workshop in two-hour sessions twice a week. Created lesson plans that engage students in participation and active learning.

- Received 10 weeks of formal training in techniques to effectively tutor and retain underrepresented students.

Fellowships & Awards

UC Irvine Teaching Assistant Fellowship   Apr. 2020 – June 2022
Donald Bren School of Information and Computer Sciences   *$56,000*
Awarded full tuition and monthly stipend for outstanding teaching ability, scholastic aptitude, and research potential. Rarely awarded to Master's students.

First Place   July 2016
CBS Interactive Company-Wide Summer Hackathon   *$1,000*
Awarded 1st place and grand prize for developing feature in the Content Management System that allows CBS articles to be published directly from Twitter. Increased SEO, article views, and ad revenue.

Provost Honors   2013 – 2017
UC San Diego
Awarded four times for maintaining a top quarterly GPA.

Service

STEM Blog   Jan. 2021 – Present
brookekryan.com

- I maintain a STEM blog and website, where I write about topics and host tutorials to make Computer Science, Software Engineering, and Artificial Intelligence more accessible to underrepresented groups.

Girls Who Code, Lead Instructor   May 2021 – July 2021
Virtual Summer Immersion Program, *AT&T*   Remote

- Head instructor of virtual 2-week summer program for 10th-11th grade girls. Taught 30+ students and led 2 undergraduate teaching assistants. Used JavaScript, CSS, and HTML to develop an activism-focused informative webpage.

Girls Who Code, Lead Instructor   May 2019 – Aug. 2019
Summer Immersion Program, *Blizzard Entertainment*   Irvine, CA

- Leader of teaching team and 20+ students in flagship 7-week summer program for 10th-11th grade girls, teaching computer science fundamentals using Scratch, Python, Arduino, C, JavaScript, CSS, and HTML.

- Implemented original curriculum to further understanding and engagement in advanced topics such as Git, command line, and Python source code. Rated highest-performing teaching team in the Southern California.

K-12 STEM Education Program, Global Teams in Engineering Service   Sept. 2016 – June 2017
Undergraduate Project Advisor, *Jacobs School of Engineering*   San Diego, CA

- Facilitated visits to local schools to engage children in STEM topics taught by UCSD engineering students.

- Trained UCSD students in active learning and creation of engaging lesson plans based on participant age, knowledge level, and interest.

SKILLS

Machine Learning Libraries: Keras, Tensorflow, PyTorch, Jax, Flax, Scikit-Learn, NumPy, Weights and Biases

Programming Languages: Python, Java, C++, C, Kotlin, Scala, JavaScript, Ruby, HTML, CSS, SQL

Distributed Computing: CUDA, Sun Grid Engine, Linux, Unix, Bash, AWS

Natural Language Processing: AllenNLP, HuggingFace, SpaCy, NLTK, Gensim

Embedded Computing: Arduino, Raspberry Pi

Software Engineering: Node.js, React Native, Jekyll, functional programming, software design, code generation, Git, backend software engineering, front-end software engineering, quality engineering, human-centered design

MISCELLANEOUS

John Muir Trail   Aug. 2019 – Sept. 2019
211-mile long-distance backpacking trail in the Sierra Nevada Mountain range. Hiked in 24 days.

Ocean Lifeguard, Huntington State Beach   July 2012 – June 2014
Performed over 100 aquatic ocean rescues in three years of service; busiest state beach in California.