Brooke K. Ryan

Ph.D. Student in Computational Cognitive Neuroscience | Artificial Intelligence Researcher

brooke.ryan@princeton.edu | linkedin.com/in/brookekryan | brookekryan.com | Princeton, NJ

Education

PRINCETON UNIVERSITY
Ph.D. Psychology
Advisor: Uri Hasson
Aug. 2023 - Present

UC IRVINE
M.S. Computer Science
Sep. 2020 - Sep. 2022

UC SAN DIEGO
B.S. Mathematics & Computer Science
Sep. 2013 - Jun. 2017

Skills

Programming Languages

• Python • Java • C++ • C • Kotlin Scala • JavaScript • Ruby • HTML/CSS • SQL • Bash • Shell • MATLAB

Data Science & AI/ML

• Keras • TensorFlow • PyTorch • JAX • Flax • WandB • Data visualization • Matplotlib • NumPy • Scikit-Learn • Pandas • CUDA • Sun Grid Engine • Data wrangling •

Computational Research

• Deep learning • Artificial neural networks • Transfer learning • Bayesian statistics • Cognitive modeling • Algorithm design •

Software Engineering

• Git • Command Line • Scripting • Spring • Tomcat • Undertow • Jenkins • Architecture • Object-oriented Design • Data structures • Microservices • Cloud/ AWS

Awards

UC Irvine Teaching Assistant Fellowship | $56,000
Provost Honors, UC San Diego

Teaching

Information Retrieval • Reverse Engineering and Modeling • Programming Styles • Humanitarian Engineering • Girls Who Code SIP •

Research Experience

NEURAL NETWORKS & HUMAN BEHAVIOR · Graduate Researcher
Advisor: Professor Marcelo Mattar, NYU — Aug. 2022 – Present

• Lead student in artificial intelligence research project investigating neural networks pre-trained with optimal priors for predicting human decision-making in small-data regimes.
• Generated new dataset with optimal targets to supply for pre-training methodology.
• Constructed experimental pipeline using Python, JAX, Matplotlib, weights and biases, etc. to train models with increasing proportions of human data. Preliminary results show accuracy converges more efficiently on models using pre-training with optimal priors.

DEEP LEARNING & COMPUTER VISION · Graduate Researcher
Advisor: Professor Pierre Baldi, UCI — Mar. 2021 – Dec. 2021

• Lead student in interdisciplinary Computer Vision research project investigating machine and human vision parallels using CNNs and ophthalmology experiments.
• Constructed series of experiments using Python, Tensorflow, training models of neural networks and injecting "literacy" by providing additional training on the EMNIST dataset.
• Investigated deep autoregressive generative models, STAR-GAN, EDSR. Applied image augmentation, architecture modification, hyperparameter optimization via SHERPA.

Software Engineering Experience

BLIZZARD ENTERTAINMENT — Associate Software Engineer
Irvine, CA (remote) — Jan. 2020 - Feb. 2021

• Backend Java engineer in the Battle.net organization, delivering eCommerce APIs and capabilities on the Purchase team; additionally working in SQL and relational databases.
• Implemented critical Purchase-system APIs to implement functionality to support new payment methods & platforms; presented an organization-wide talk on project.

INTUIT INC. — Software Engineer I
San Diego, CA — Aug. 2017 - Nov. 2018

• Backend Java engineer; delivered Identity capabilities across Intuit products.
• Created Spring "Annotator" tool, automatically converts Spring XML project to equivalent annotation configuration. Increased unit test speed 12x, reduces server runtime. Gave organization-wide tech talk on open-sourcing for 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, eliminated 20% of failures.

INTUIT INC. — Software Engineering Intern
San Diego, CA — Jun. 2016 - Sep. 2016

• Intern on iOS Turbo Tax application team, focus in Java and React Native.

CBS INTERACTIVE — Software Engineering Intern
San Francisco, CA — Jun. 2015 - Aug. 2015

• JavaScript intern on content mgmt. system team. 1st place in company-wide hackathon.

Publications

[1] **Brooke K. Ryan**, A.M. Soria, K. Dreef, and A. van der Hoek, "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 (ICSE-SEET '22), IEEE Press, 2022.