Pamela J. Osborn Popp

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[please email for additional contact details]

Skills

- *Computational*: Data analysis and statistical insights, data visualization, computational modeling, full stack web experiment design, data pipeline engineering, science communication, teaching and curriculum design, machine learning
- *Algorithmic*: Reinforcement Learning, dynamic programming, neural networks, generative AI, mixed regression models, Monte Carlo Tree Search, version control, artificial agent simulation, testing and debugging
- *Implementation*: Python scientific stack (Jupyter, Pandas, NumPy, scikit-learn, etc.), R, JavaScript, HTML/CSS, SQL, Phaser 3, MATLAB, Java, Github, UNIX, Google Firebase, Visual Studio Code, LaTeX

Experience   [github] [google scholar] [website]

New York University - Center for Neural Science   Sept 2016 - Present
Doctoral Student Researcher
Thesis work summary: Reinforcement Learning Models of Complex Behaviors
- First author on 3 quantitative research projects, led from conceptualization to publication
- Apply computational RL frameworks to predict and explain collaborative pro-social behaviors in humans and machines (multi-agent planning, theory of mind, teaching and learning)
- Contribute to online behavioral research tools: software development, testing, documentation, and training
- Published 7 peer-reviewed journal articles and conference papers, presented 11 talks and posters at intl. conferences

Selected Projects
Modeling helping and collaborative planning
- How do people help each other? Going beyond simple economic trust games to characterize pro-social agents
- Engineered the laboratory's first online live two-player experiment as a turn-based video game (Phaser 3)
- Built reactive web app to deliver game, automatically pairing users and collecting data (demo here)
- Performed RL modeling and simulations to analyze data from 3600+ two-player games in Python and R
- Applications to Intelligent Tutoring Systems, Virtual Assistants, Augmented Reality, Human-Machine Interaction

Human and Machine Teaching
- Engineered an on-line generative AI agent that selects optimal teaching actions under uncertainty about the learner
- Compared 100+ human participants' intuitive teaching choices with theoretically optimal behavior

Incentivizing Cognitive Discovery
- Investigated effect of financial incentives on category learning (in short, "can you pay people to learn better?")
- Fit Bayesian mixed-effects regressions in Python to detect patterns in data from over 1100 participants

Modeling Language Learning
- Part of 5 member team that placed 2nd in Duolingo's 2018 Second Language Acquisition Modeling Competition
- Improved classification performance by over 11% by applying psychologically-informed feature engineering to machine learning models (published & presented at NAACL 2018)

Teaching

Columbia University High School Program Instructor   2018 - 2021
  - Designed and independently taught 3-week neuroscience course to advanced high school students
  - Developed interactive digital course material for virtual teaching in Canvas
Teaching Assistant for NYU Undergraduate Introduction to Neural Science   2017, 2019
  - Gave invited guest lectures on Language, Memory
Docent in the Brooklyn Botanic Garden (Volunteer work)   2017 - 2018

Education

NYU Graduate School of Arts and Science   Sept 25, 2023
        Ph.D. in Neuroscience
        Thesis: A Cognitive Analysis of Learning, Teaching, and Collaborating

NYU College of Arts and Science   May 18, 2016
        B.S. with High Honors in Neuroscience, 3.66 GPA
        Minor in Mathematics and Computer Science
        Presidential Honors Scholar, CAS Dean's full tuition merit-based scholarship all 4 years