

AAKRITI KUMAR

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EDUCATION

PhD in Cognitive Science

2018 - 2023 (*expected*)

University of California, Irvine

Advisor: Mark Steyvers

MS in Statistics

2018 - 2022 (*expected*)

University of California, Irvine

BTech in Engineering

2011 - 2015

Indian Institute of Technology, Madras

RESEARCH PROJECTS

Theory of Mind & Theory of Machine

Advisor: [Mark Steyvers](#)

Human-Computer Interaction

Question: How do humans assess their ability, the ability of others, and how good they are at it?

- Designed and ran an interactive human subject experiment on Amazon MTurk, using HTML and JavaScript
- Developing Bayesian cognitive models to capture a human's assessment of their own and another agent's (human/AI) ability

Algorithm Aversion & Metacognitive Bandits

Advisor: Mark Steyvers

Human-Computer Interaction

Question: How do humans decide on when to ask for AI advice?

- Constructed new cognitive models (based on the bandit framework) of humans' advice seeking behavior when working with an AI assistant
- Demonstrated that algorithm aversion, a widely reported bias, can be explained as the result of a quasi-optimal sequential decision-making by the human

Human-AI Complementarity

Advisor: Mark Steyvers

Human-Computer Interaction

Question: Do humans and an AI agent show complementary ability at a Natural Language Understanding task?

- Carried out a comparative study of human performance (data collected via a human subject study), machine predictions, and a combination of human and machine predictions to investigate complementary abilities of humans and machine

Trust between Humans and Machines

Advisor: Mark Steyvers

Human-Computer Interaction

Question: What factors influence trust between humans and machines?

- [Reviewed](#) and synthesized existing literature on human-AI trust and collaboration.

Reliability in Inhibitory Control

Collaboration with [Pradeep Shenoy](#), [Google Research - India](#)

Cognitive Control & Meta-Learning

Question: Can flexible functions (RNNs) reliably identify people across sessions of a cognitive control task?

- Proposed and evaluated recurrent neural network models to learn individual-specific parameters in cognitive control task data

Learning and Forgetting in Lumosity Data

Advisor: Mark Steyvers, Aaron Benjamin (UIUC)

Human Learning

Question: What is the effect of long delays between cognitive games on forgetting and skill learning?

- Analysed large-scale game play data from the Lumosity platform and proposed a computational model to characterise learning and forgetting behavior across individuals and cognitive tasks over time

Individual differences in Inhibition

Advisor: Jeff Rouder

Cognitive Control

Question: Is inhibition a unified concept?

- Developed Bayesian hierarchical models to separate trial noise from other covariation in low signal, high-noise inhibition task data

PUBLICATIONS & PRESENTATIONS

Aakriti Kumar, Trisha Patel, Aaron Benjamin, Mark Steyvers (2021). Explaining Algorithm Aversion with Metacognitive Bandits

Cognitive Science 2021[\[paper\]](#)

Aakriti Kumar, Trisha Patel, Aaron Benjamin, Mark Steyvers (2021). Explaining Algorithm Aversion with Metacognitive Bandits

Workshop on Human-AI Collaboration in Sequential Decision-Making, ICML 2021

Aakriti Kumar, Trisha Patel, Aaron Benjamin, Mark Steyvers (2021). Metacognitive Bandits: When Do Humans Seek AI Assistance?

Social Intelligence in Humans and Robots Workshop, ICRA 2021

Aakriti Kumar, Soumya Chatterjee, Pradeep Shenoy (2021). Meta-learning of Dynamic Policy Adjustments in Inhibitory Control Tasks [In submission]

Jeffrey N. Rouder, **Aakriti Kumar**, Julia M. Haaf (2019). Why Most Studies of Individual Differences With Inhibition Tasks Are Bound To Fail [\[preprint\]](#)

AWARDS AND FELLOWSHIPS

[Irvine Initiative in AI, Law, and Society Fellowship 2021](#)

Total Award: \$22,000

Graduate Dean's Recruitment Fellowship 2018, UCI

Total Award: \$5000

Recruitment Fellowship Award, 2018, Department of Cognitive Science, UCI

Total Award: \$5000

TEACHING EXPERIENCE

Teaching Assistant, UC Irvine: Probability and Statistics in Psychology I, II, III Fall 2019 - Spring 2020

Lead Teaching Assistant, UC Irvine: Introduction to Human Memory

Winter 2019

Teaching Assistant, UC Irvine: Introduction to Psychology

Fall 2018

SKILLS

Programming: Python (pandas, numpy, matplotlib, scikit-learn, pytorch, tensorflow), R, Stan, HTML/CSS

Research Methods: Experiment Design, Computational Cognitive Models, Generalised Linear Models, Bayesian Statistics, Probabilistic Learning, Deep Learning

PROFESSIONAL EXPERIENCE

Research Associate, IIT Madras

Mar'17 - May'18

Consultant on analytics projects involving fraud detection.

Modeled supply chain dishonesty arising due to information asymmetry in a principal-agent system

Associate Program Manager, Ola cabs

Jun'15 - Aug'16

Corporate Strategy & Process Excellence

Ola Store, City Manager (Chennai): Led a team of 40 employees to launch operations of hyper-local delivery services arm

Ola Airport Pickup Process (Bangalore, Mumbai): Designed a process for smooth passenger and driver movement. Worked with the product team to add driver side demand based alert features on the app

MEMBERSHIPS AND SERVICE

Department Colloquium Coordination Committee Member

2021 - 2022

Cognitive Science Society Student Member

Psychonomic Society Student Member

Contributed to [Advancing the Understanding of Attentional Control](#)

Psychonomics 2018