# AAKRITI KUMAR

(+1) 949-372-8021 ⋄ aakritk@uci.edu ⋄ [aakritikumar.com](aakritikumar.com)

## 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

### AI for Social Good: Improving Maternal Health Outcomes
*Collaboration with Milind Tambe*  *Google Research - India*
**Question**: Do AI tools help increase engagement in a maternal healthcare program?

- Assessing the impact of deploying Restless Bandits to prevent drop-off from a maternal health information program for new and expectant mothers in India

### 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*