Angela J. Yu

ajyu@ucsd.edu

Research

My lab utilizes rigorous and diverse tools to understand the nature of representation and computations that give rise to intelligent behavior, in particular with regard to how the brain copes with uncertainty in inference, learning, decision-making, and social cognition. Using Bayesian statistical modeling tools, control theory, reinforcement learning, information theory, and dynamical systems analysis, we develop mathematical and computational theories that attempt to explain disparate aspects of cognition: perception, attention, decision-making, learning, cognitive control, active sensing, economic choice, and social perception and decision-making. My lab mainly specializes in theoretical modeling, but also utilizes various experimental methods, e.g. behavior, eye-tracking, fMRI, to help develop and validate the theoretical concepts. In addition, we collaborate with a number of experimentalists on a range of topics related to human and animal cognition, including neural and psychiatric impairments.

Employment

University of California San Diego **La Jolla, CA**

2014 - Present: Associate Professor (2008 - 2014: Assistant Professor), Department of Cognitive Science. Director of Computational and Cognitive Neuroscience Laboratory. Founding faculty of the Halicioglu Data Science Institute. Faculty member of the Contextual Robotics Institute, the Institute for Neural Computation, The Temporal Dynamics of Learning Center, the Neurosciences PhD Program, and Affiliate Faculty in Computer Science and Engineering Department.

Education

Princeton University **Princeton, NJ**

April, 2005 - July, 2008

Post-doctoral fellow in the Center for the Study of Brain, Mind, and Behavior. Sloan-swartz fellow for computational neuroscience.

UCL Gatsby Computational Neuroscience Unit **London, UK**

October, 2000 - June, 2005

Ph.D in Computational Neuroscience.

Massachusetts Institute of Technology **Cambridge, MA**

September, 1996 - June, 2000

B.S. in Mathematics (Theoretical), B.S. in Computer Science, B.S. in Brain & Cognitive Sciences; Concentration in German.

Publications

Cogliati Dezza, I, Noel, X, Cleeremans, A, **Yu, A J** (2021). Distinct motivations to seek out information in healthy individuals and problem gamblers. Translational Psychiatry, 11, 408.

He, Z W, **Yu, A J** (2021). Gender differences in face-based trait perception and social decision making. Proceedings of the Annual Meeting of the Cognitive Science Society, 43.

Guo, D, **Yu, A J** (2021). Revisiting the role of uncertainty-driven exploration in a (perceived) non-stationary world. Proceedings of the Annual Meeting of the Cognitive Science Society, 43.

Ryali, C K, Goffin, S, Winkielman, P, **Yu, A J** (2020). From likely to likable: The role of statistical typicality in human social assessment of faces. Proceedings of the National Academy of Sciences, 117(47): 29371-29380.

Cogliati Dezza, I, Noel, X, Cleeremans, A, **Yu, A J** (2020). What drives information-seeking in healthy and addicted behaviors. BioRxiv.

Ryali, C, Wang, X, Yu, **A J** (2020). Leveraging computer vision face representation to understand human face representation. Proceedings of the Annual Meeting of the Cognitive Science Society.

Zhou, C, Guo, D, Yu, **A J** (2020). Devaluation of unchosen options: A Bayesian account of the provenance and maintenance of overly optimistic expectations. Proceedings of the Annual Meeting of the Cognitive Science Society.

Huang, S J, Ryali, C, K, Liu J, Guo, D, Guan, J, Li, Y, **Yu, A J** (2019). A Model-Based Investigation of the Biological Origin of Human Social Perception of Faces. Proceedings of the Annual Meeting of the Cognitive Science Society.

Guan, J, Ryali, C, **Yu, A J** (2018). Computational modeling of social face perception in humans: Leveraging the active appearance model. BioRxiv.

Ryali, C, **Yu, AJ** (2018). Beauty-in-averageness and its contextual modulations: A Bayesian statistical account. *Advances in Neural Information Processing Systems*, **32**.

Guo, D, **Yu, AJ** (2018). Why so gloomy? A Bayesian explanation of human pessimism bias in the multi-armed bandit task. *Advances in Neural Information Processing Systems*, **32**.

Ryali, C, Gautaum, R, **Yu, AJ** (2018). Demystifying excessively volatile human learning: A Bayesian persistent prior and a neural approximation. *Advances in Neural Information Processing Systems*, **32**.

Wang W, Hu S, Ide JS, Zhornitsky S, Zhang S, **Yu, AJ**, Li CR (2018). Motor preparation disrupts proactive control in the stop signal task. *Frontiers Human Neuroscience.*. doi: 10.3389/fnhum.2018.00151.

Cogliati Dezza, I, **Yu, A J**, Cleeremans, A, Alexander, W (2017). Learning the value of information and reward over time when solving exploration-exploitation problems. *Nature Scientific Reports*, **7**:76919.

Harlé, K M, Guo, D, Zhang, S, Paulus, M, **Yu, A J** (2017). Anhedonia and anxiety underlying depressive symptomatology have distinct effects on reward-based decision-making. *PLoS ONE* **12**(10):e0186473.

Harlé, K M, Zhang, S, Ma, N, **Yu*, A J**, & Paulus, M P* (2016). Reduced neural recruitment for Bayesian adjustment of inhibitory control in methamphetamine dependence. *Biological Psychology: Cognitive Neuroscience and Neuroimaging*, **1**: 448-459. *Co-senior authors.

Li L, Malave, V, Song, A, & **Yu, A J** (2016). Extracting Human Face Similarity Judgments: Pairs or Triplets? *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Ma, N & Yu, A J (2016). Stop paying attention: the need for explicit stopping in inhibitory control. *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Ma, N & **Yu, A J** (2016). Inseparability of Go and Stop in Inhibitory Control: Go Stimulus Discriminability Affects Stopping Behavior. *Frontiers in Decision Neuroscience*, **10** (54). doi: 10.3389/fnins.2016.00054.

Harlé, K M, Zhang, S, Schiff, M, Mackey, S, Paulus, M P*, & **Yu, A J*** (2015). Altered statistical learning and decision-making in methamphetamine dependence: Evidence from a two-armed bandit task. *Frontiers in Psychology*, **6** (1910). *Co-senior authors.

Harlé, K M, Steward, J L, Zhang, S, Tapert, S, Paulus, M P*, & **Yu*, A J** (2015). Bayesian neural adjustment of inhibitory control predicts emergence of problem stimulant use. *Brain*, **138**:3413-26. *Co-senior authors.

Ma, N & **Yu, A J** (2015). Statistical Learning and Adaptive Decision-Making Underlie Human Response Time Variability in Inhibitory Control. *Frontiers in Psychology*, **6** (1046).

Ide, J S, Hu, S, Zhang, S, **Yu, A J** & Li, C-S R (2015). Impaired Bayesian learning for cognitive control in cocaine dependence. *Drug and Alcohol Dependence*, **151**: 220-227.

Ahmad, S & **Yu, A J** (2015). A rational model for individual differences in preference choice. *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Ma, N & **Yu, A J** (2015). Variability in response time reveals statistical learning and adaptive decision-making. *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Zhang, S, Song, M, & **Yu, A J** (2015). Bayesian hierarchical model of local-global processing: Visual crowding as a case-study. *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Yu, A J & Huang, H (2014). Maximizing masquerading as matching: Statistical learning and decision-making in choice behavior. *Decision*, **1** (4): 275-287.

Ahmad, S, Huang, H, & **Yu, A J** (2014). Cost-sensitive Bayesian control policy in human active sensing. *Frontiers in Human Neuroscience*, doi: 19.3389/fnhum.2014.00955.

Yu, A J (2014). Computational Models of Neuromodulation. *Encyclopedia of Computational Neuroscience.* Springer.

Yu, A J (2014). Decision Making Tasks. *Encyclopedia of Computational Neuroscience.* Springer.

Zhang, S, Huang, H, & **Yu, A J** (2014). Sequential effects: A Bayesian analysis of prior bias on reaction time and behavioral choice. *Proceedings of the Annual Meeting of the Cognitive Science Society.*

Ahmad, S & **Yu, A J** (2014). A socially aware Bayesian model for competitive foraging. *Proceedings of the Cognitive Science Society Annual Meeting.*

Harlé, K M, Shenoy, P, Steward, J L, Tapert, S, **Yu*, A J**, Paulus*, M P (2014). Altered neural processing of the need to stop in young adults at risk for stimulus dependence. Journal of Neuroscience, 34(13): 4567-4580. *Co-senior authors.

Ahmad, S, Huang, H, & **Yu, A J** (2013). Context-sensitivity in human active sensing. *Advances in Neural Information Processing Systems* **26**. Cambridge, MA: MIT Press.

Zhang, S & **Yu, A J** (2013). Forgetful Bayes and myopic planning: Human learning and decision-making in a bandit setting. *Advances in Neural Information Processing Systems* **26**. Cambridge, MA: MIT Press.

Zhang, S & **Yu, A J** (2013). Cheap but clever: Human active learning in a bandit setting. *Proceedings of the Thirty-Fifth Annual Conference of the Cognitive Science Society.*

Shenoy, P & **Yu, A J** (2013). A rational account of contextual effects in preference choice: What makes for a bargain? *Proceedings of the Thirty-Fifth Annual Conference of the Cognitive Science Society.*

Dayanik, S & **Yu, A J** (2013). Reward-rate maximization in sequential identification under a stochastic deadline. *SIAM Journal on Control and Optimization*, **51** (4), 2922-2948.

Ahmad, S & **Yu, A J** (2013). Active sensing as Bayes-optimal sequential decision-making. *Proceedings of the Twenty-Ninth Conference on Uncertainty in Artificial Intelligence (UAI)*, 12-21. Eds. Ann Nicholson, Padhraic Smyth. Corvallis, Oregon: AUAI Press.

Yu, A J (2013). Bayesian Models of Attention. Chapter in *Handbook of Attention*, Eds. S. Kastner & K. Nobre. Oxford, UK: Oxford University Press.

Ide, J S, Shenoy, P, **Yu*, A J**, & Li*, C-R (2013). Bayesian prediction and evaluation in the anterior cingulate cortex. *Journal of Neuroscience*, **33**: 2039-2047. (* Yu & Li contributed equally as senior authors.)

Shenoy, P & **Yu, A J** (2012). Rational impatience in perceptual decision-making: a Bayesian account of discrepancy between two-alternative forced choice and Go/NoGo behavior. *Advances in Neural Information Processing Systems* **25**. Cambridge, MA: MIT Press.

Paulus, M P & **Yu, A J** (2012). Emotion and decision-making: Affect-driven belief systems in anxiety and depression. *Trends in Cognitive Sciences* **16**: 476-483. Epub 2012 Aug 13.

Yu, A J (2012). Change is in the eye of the beholder. *Nature Neuroscience* **15**: 933-935.

Shenoy, P & **Yu, A J** (2011). Wherefore a horse race: Inhibitory control as rational decision-making. Chapter in *Neural Basis of Motivational and Cognitive Control*, pp. 371-388. Ed. R. Mars, J. Sallet, M. Rushworth, and N. Yeung. Cambridge, MA: MIT Press.

Shenoy, P & **Yu, A J** (2011). Rational decision-making in inhibitory control. *Frontiers in Human Neuroscience* **5**:48. doi: 10.3389/fnhum.2011.00048.

Yu, A J (2011). Uncertainty and neuromodulation: acetylcholine and sustained attention. Chapter in *Neuroscience of Decision Making*, pp. 97-124. Ed. O. Vartanian and D R. Mandel. Psychology Press.

Shenoy, P, Rao, R, & **Yu, A J** (2010). A rational decision making framework for inhibitory control. *Advances in Neural Information Processing Systems* **23**: 2146-2154. MIT Press, Cambridge, MA.

Yu, A J & Cohen, J D (2009). Sequential effects: Superstition or rational behavior? *Advances in Neural Information Processing Systems* **21**: 1873-1880. MIT Press, Cambridge, MA.

Liu, S, **Yu, A J**, & Holmes, P (2008). Dynamical analysis of Bayesian inference models for the Eriksen task. *Neural Computation* **21**: 1520-1553.

Yu, A J, Dayan, P, & Cohen J D (2009). Dynamics of attentional selection under conflict: Toward a rational Bayesian account. *Journal of Experimental Psychology: Human Perception and Performance*, **35**: 700-717.

Frazier, P & **Yu, A J** (2008). Sequential hypothesis testing under stochastic deadlines. Advances in *Neural Information Processing Systems* **20**: 465-72. MIT Press, Cambridge, MA.

Yu, A J. (2007) Adaptive behavior: Humans act as Bayesian learners. *Current Biology* **17**: R977-R980.

Cohen, J D, McClure, S M, & **Yu, A J** (2007). Should I stay or should I go? How the human brain manages the tradeoff between exploitation and exploration. *Philosophical Transactions of the Royal Society B: Biological Sciences* **362**: 933-942.

Yu, A J (2007). Optimal change-detection and spiking neurons. *Advances in Neural Information Processing Systems* **19**: 1545-52. MIT Press, Cambridge, MA.

Dayan, P & **Yu, A J** (2006). Phasic norepinephrine: A neural interrupt signal for unexpected events. *Network: Computation in Neural Systems*, **17**: 335-50.

Dayan, P & **Yu, A J** (2006). Norepinephrine and neural interrupts. *Advances in Neural Information Processing Systems* **18**: 243-50. MIT Press, Cambridge, MA.

Yu, A J (2005). *Acetylcholine and Norepinephrine: Bayes, Uncertainty, Attention, and Learning*. PhD thesis, Gatsby Computational Neuroscience Unit, University College London, University of London.

Yu, A J & Dayan, P (2005). Uncertainty, neuromodulation, and attention, *Neuron*, **46**: 681-692. (Reviewed in *Faculty 1000*, *Neuron*, *Nature*, and *Science*.)

Yu, A J & Dayan, P (2005). Inference, attention, and decision in a Bayesian neural architecture. In *Advances in Neural Information Processing Systems* **17**: 1577-84. MIT Press, Cambridge, MA.

Yu, A J & Dayan, P (2003). Expected and unexpected uncertainty: ACh and NE in the neocortex. In *Advances in Neural Information Processing Systems* **15**. MIT Press, Cambridge, MA.

Dayan, P & **Yu, A J** (2003). Uncertainty and learning. *IETE Journal of Research*, **49**: 171-181.

Yu, A J & Dayan, P (2002). Acetylcholine in cortical inference. *Neural Networks*, **15** (4/5/6): 719-730.

Dayan, P & **Yu, A J** (2002). Acetylcholine, uncertainty, and cortical inference. In T G Dietterich, S Becker, and Z Ghahramani (eds.) *Advances in Neural Information Processing Systems* **14**. MIT Press, Cambridge, MA.

Yu, A J, Giese, M A, & Poggio, T (2002). Biophysiologically Plausible Implementations of Maximum Operation. *Neural Computation*, **14** (12): 2857-2881.

Teaching

UCSD **San Diego, CA**

Undergraduate

Statistical machine learning (Cogs 118A): 2008-10
Introduction to Cognitive Science (Cogs 1): 2008-09, 2010-11, 2012-14, 2019-21
Neural Coding in Sensory Systems (Cogs 160, Cogs 180): 2009-12, 2013-14, 2015-16, 2016-17
Decision Making in the Brain (Cogs 180): 2019-21
Mathematical Statistics for Behavioral Data Analysis (Cogs 118D): 2016-18

Graduate

Foundation Course in Cognitive Modeling (Cogs 202): 2011-14, 2015-16, 2018-21
Computational Models of Sensory Coding (Cogs 260): 2009-10
Statistical Methods and Applications in Cognitive Science (Cogs 260): 2010-11
Cognition under Uncertainty (Cogs 200): 2011-12
Statistical Inference and Data Analysis (Cogs 243): 2016-18
Toward a Computational Understanding of Natural Intelligence and Behavior: Models, Algorithms, and Theories (Cogs 260): 2019-20

Summer School on Computational Modeling of Behavior
CRM, Barcelona, Spain

August, 2019. Lectures on "Reinforcement Learning" and "Computational Modeling of Human Face Processing"

Summer School on Cognitive Foundations of Economic Behavior **Vitznau, Switzerland**
June-July, 2019. Lecture on "Cognitive Modeling"

Kavli Summer Institute in Cognitive Neuroscience **UCSB, Santa Barbara, CA**
August, 2017. Lecture on "Learning and Decision Making in Inhibitory Control"

Comp. Sensory-Motor Neurosci. Summer School, Queen's Univ. **Ontario, Canada**
August, 2013. Lectures and tutorials.

Okinawa Computational Neuroscience Summer Course **Okinawa, Japan**
June, 2011. Lecturer on Bayesian modeling and decision theory.
November, 2004. Course tutor for "Bayesian Modeling" section.

Programme Gulbenkian Champalimaud Neuroscience **Lisbon, Portugal**
May, 2008. Lecturer on "Decision-Making" and "Reinforcement Learning"

UCLA Institute of Pure and Applied Mathematics **LA, CA**
July, 2007. "Bayesian Decision-Making", lecturer in Graduate Summer School: "Probabilistic Models of Cognition: The Mathematics of Mind"

Columbia University **New York, NY**
October, 2006. Guest lecturer for an upper-level graduate course "Global Brain Modeling" in Dept. Electrical Engineering.

Massachusetts Institute of Technology **Cambridge, MA**
IAP, 2000. Guest lecturer ("Modeling Neural Circuits") in IAP course: "Learning: Theory, Engineering Applications, and Brains"

Massachusetts Institute of Technology **Cambridge, MA**
Fall, 1999. Teaching assistant for "Introduction to Psychology"

Awards Grants Fellowships

May, 2018 - UCSD General Campus Bridge Grant "Learning and Decision-Making in Human Exploratory Behavior "
March, 2018 - UCSD Social Sciences Division Research Grant "Computational Modeling of Facial Features Underlying Social Processing of Faces"
January, 2018 - UCSD Chancellor's Research Excellence Scholarship "Neural Coding of Facial Features Underlying Social Perception of Faces"
September, 2017 - UCSD Contextual Robotics Seed Grant "Computational Physiognomy for Human Robot Teaming"
June, 2017 - UCSD Academic Senate Research Grant "Bayesian Modeling of Human Face Processing"
February, 2017 - UCSD Frontiers of Innovation Fellowship "Characterizing human representation of complex information based on crowdsourced data"
June, 2016 - UCSD Academic Senate Research Grant "Bayesian Embedding Algorithms for Human Similarity Judgments"
February, 2016 - UCSD Frontiers of Innovation Fellowship "Learning to stop in healthy humans and stimulant users: a Bayesian model-based Analysis"
June, 2015 - UCSD Frontiers of Innovation Fellowship "From pixels to perceptual manifolds: Utilizing machine learning to understand the perception of facial attractiveness"
September, 2013 - NSF CRCNS Award "A computational and neuroimaging investigation of prediction and learning in cognitive control" (PI)
July, 2013 - US Army Research Office MURI Award "Value-Centered Information Theory for Adaptive Learning, Inference, Tracking, and Exploitation" (Project Lead)
July, 2013 - UAI Conference Scholarship
January, 2013 - UCSD Academic Research Grant "Human Decision-Making under Competitive Pressure"
July, 2012 - Qualcomm Fellow, Advisor, Mentor (FMA) Fellowship
April, 2012 - Nominee for James S. McDonnell Foundation Scholar Award in Understanding Human Cognition
July, 2011 - NIH NIDA B/START R03 award "A neurocognitive and computational study of inhibitory control in substance use"
July, 2011 - Hellman Foundation Fellowship
May, 2010 - US Arm Research Lab collaborative grant: "Cognition and Neuroergonomics Collaborative Technology Alliance", project leader

July, 2008 - UCSD Aademic Senate Research Grant " Psychophysical Studies of Visual Processing and Cognitive Control of Eye Movements"
October, 2007 - Finalist for Burroughs Wellcome Fund's "Career Awards at the Scientific Interface"
December, 2006 - Neural Information Processing Systems Travel Grant
October, 2006 - Finalist for Burroughs Wellcome Fund's "Career Awards at the Scientific Interface"
December, 2005 - Neural Information Processing Systems Travel Grant
June, 2005 - NIH NRSA Training Grant
October, 2004 - Brain Trust Travel Grant
December, 2003 - UCL Graduate School Student Conference Fund Major Award
September, 2003 - Travel fellowship for AIM workshop "Inference and Prediction in Neocortical Circuits"
May, 2003 - Finalist for Royal Institution "UK Science Graduate of the Year Award"
November, 2002 - UCL Graduate School Student Conference Fund Major Award
June, 2001 - UCL Bogue Research Fellowship
May, 2001 - Travel fellowship for 5th International Conference on Cognitive & Neural Systems
September, 2000 - UCL Graduate School Research Scholarship
June, 2000 - NSF Graduate Research Fellowship
May, 2000 - MIT Award for Excellence in Scholarship in Brain Science
May, 2000 - Elected member of Phi Beta Kappa (MIT chapter)
January, 2000 - MIT Theodore Mangelsdorf Scholarship
April, 1998 - Elected Member and Officer of Eta Kappa Nu (MIT chapter)
April, 1995 - National Merit Scholarship

Talks

Society for Neuroscience Annual Meeting – Orlando, FL
November, 2002. "ACh and selective attention."

The Annual Computational Neuroscience meeting – Alicante, Spain
July, 2003. "Attention: Theory and Mechanism"

Wellcome Functional Imaging Laboratory, UCL – London, UK
January, 2004. "Neuromodulation, Uncertainty, and Attention"

Neural Information Processing Systems – Vancouver, BC, Canada
December, 2004. "Inference, Attention, and Decision in a Bayesian Neural Architecture"

Society for Neuroscience Annual Meeting – Washington, DC
November, 2005. "Top-down and Bottom-up: Modeling the Cholinergic Link"

Neural Information Processing Systems – Vancouver, BC, Canada
December, 2005. "Norepinephrine and Neural Interrupts"

Neuroscience Colloquium Princeton University – Princeton, NJ
February, 2006. "A Bayesian View of Sensory Conflicts in Decision-Making"

Gatsby Computational Neuroscience Unit, UCL – London, UK
February, 2006. "A Bayesian View of Sensory Conflicts in Decision-Making"

Gatsby Computational Neuroscience Unit, UCL – London, UK
June, 2006. "To Spike or Not to Spike: Optimal Change-Detection in Single Neurons"

Computer Science Theory Seminar Series Princeton University – Princeton, NJ
July, 2006. "To Spike or Not to Spike: Optimal Change-Detection in Single Neurons"

Brain and Cognitive Sciences Seminar, MIT – Cambridge, MA
August, 2006. "Neuromodulation, Uncertainty, and Attention"

Neuroscience Retreat Princeton University – Princeton, NJ
September, 2006. "To Spike or Not to Spike: Optimal Change-Detection in Single Neurons"

Colloquium: Neurons, Brains, & Models University of Michigan, Ann Arbor
September, 2006. "To Spike or Not to Spike: Optimal Change-Detection in Single Neurons"

Psychonomic Society Annual Meeting – Houston, TX
November, 2006. "A Bayesian View of Sensory Conflicts in Decision-Making"

Cognitive Neuroscience Society Meeting – New York, NY
May, 2007. "Uncertainty, Neuromodulation, and Attention" in the symposium "Context-sensitive neural dynamics and cognitive control: New insights from information theory"

Wellcome Functional Imaging Laboratory, UCL – London, UK
May, 2007. "A Bayesian Framework for Dynamic Attentional Selection"

Institute of Neuroinformatics UNI-ETH – Zurich, Switzerland
May, 2007. "A Bayesian Framework for Dynamic Attentional Selection"

UCLA Institute for Pure and Applied Mathematics (IPAM) – Los Angeles, CA
Lecturer at Graduate Summer School "Probabilistic Models of Cognition: The Mathematics of Mind"
July, 2007. "Bayesian Decision-Making"

Society for Neuroscience Annual Meeting – San Diego, CA
November, 2007. "A Bayesian framework for dynamic attentional selection under conditions of perceptual conflict: Applications to Eriksen and Stroop tasks"

Redwood Theoretical Neuroscience Institute – University of California, Berkeley
March, 2008. "Sequential Effects: Superstition or Adaptive Behavior?"

Champalimaud Neuroscience Program Course Lectures, Instituto Gulbenkian de Ciencia – Lisbon, Portugal
May, 2008. "Acetylcholine and Norepinephrine," "Optimal Decision-Making"

Theoretical Neuroscience Seminar, Ecole Normale Superior – Paris, France
June, 2008. "Deciding when to decide: optimal decision-making under time pressure"

Gatsby Computational Neuroscience Unit External Seminar
University College London, London, UK
June, 2008. "Deciding when to decide: optimal decision-making under time pressure"

Engineering Department Seminar, Cambirdge University – Cambridge, UK
June, 2008. "Sequential Effects: Irrational Superstition or Adaptive Behavior?"

UCSD Cognitive Neuroscience Brown Bag Seminar – La Jolla, CA
October, 2008. "Sequential Effects: Irrational Superstition or Adaptive Behavior?"

Redwood Center for Theoretical Neuroscience Seminar, UC Berkeley – Berkeley, CA
"Sequential Effects: Irrational Superstition or Adaptive Behavior?"

Cognitive Science Colloquium, Indiana University – Bloomington, IN
April, 2009. "Sequential Effects: Irrational Superstition or Adaptive Behavior?"

Computational Neuroscience Seminar, Salk Institute – La Jolla, CA
April, 2009. "Sequential Effects: Irrational Superstition or Adaptive Behavior?"

UCSD Neuroscience Graduate Program Annual Retreat – La Jolla, CA
May, 2009. "Deciding when to decide: optimal decision-making under time pressure"

Center for Perceptual Systems Seminar, University of Texas – Austin, TX
March, 2010. "Dynamics of Attentional Selection Under Conflict: Toward a Rational Bayesian Account"

Seminar, Yale University Medical School – New Haven, CT
April, 2010. "An Optimal Decision-Making Framework for Inhibitory Control"

NSF Workshop on Information Maximization Approaches for Learning and Control, UC San Diego – La Jolla CA
May, 2010. "Optimal decision-making in active visual search: effect of spatial statistics on motor planning and sensory processing"

Motivational and Cognitive Control Symposium, Oxford University – Oxford, UK
June, 2010. "Inhibitory Control as Optimal Decision-Making"

Gatsby Computational Neuroscience Unit External Seminar, University College London – London, UK
June, 2010. "Sequential Effects: Irrational Superstition or Adaptive Behavior?"

Seminar, Salk Institute – La Jolla, CA
September, 2010. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Colloquium, Smith-Kettlewell Eye Research Institute – San Francisco, CA
September, 2010. "Learning & Decision-Making in Optimal Visual Search"

Cognitive Sciences Seminar, UC Riverside – Riverside, CA
October, 2010. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Center for the Neural Basis of Cognition Colloquium, Carnegie-Mellon University – Pittsburgh, PA
October, 2010. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Cognitive Sciences Colloquium, UC Irvine – Irvine, CA
November, 2010. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Neural Information Processing Systems Conference Contributed Talk – Vancouver, BC, Canada
December, 2010. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Caltech Brain, Mind, & Society Seminar, Caltech – Pasadena, CA
April, 2011. "Optimal decision-making in inhibitory control"

Okinawa Computational Neuroscience Course, Okinawa Institute of Science and Technology – Okinawa, Japan
June, 2011. "Optimal Decision Making"

Osnabrueck Computational Cognition Alliance Meeting (OCCAM) on "Natural computation in hierarchies", University of Osnabrueck – Osnabrueck, Germany
June, 2011. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Impulsivity and Inhibition Symposium, University of Amsterdam – Amsterdam, Netherlands
June, 2011. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Gatsby Computational Neuroscience Unit External Seminar, University College London – London, UK
July, 2011. "Wherefore a Horse Race: Inhibitory Control as Rational Decision-Making"

Brown University Dept. of Cognition, Linguistics, & Psychological Sciences Colloquium – Providence, RI
February, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Neural Coding, Decision-Making, & Integration in Time Conference, Castle of Rauischholzhausen – Marburg, Germany
April, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Academy Colloquium: "New Insights from Model-Based Cognitive Science", Royal Netherlands Academy of Arts and Sciences – Amsterdam, Netherlands
May, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Departmental Colloquium Series, Computer Science and Engineering Department, UCSD – La Jolla, CA
May, 2012. "Optimizing the speed-accuracy tradeoff in decision-making: insights from the brain"

Cognitive Science Brown Bag, UCSD – La Jolla, CA
May, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Seminar, Computer Science Department, UC Irvine – Irvine, CA June, 2012. "Optimizing the speed-accuracy tradeoff in decision-making: insights from the brain"

Gatsby Computational Neuroscience Unit External Seminar, University College London – London, UK
June, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Modeling of Cognitive Processes Symposium, Bernstein Center for Computational Neuroscience – Berlin, Germany
June, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Center on Interoceptive Dysregulation in Addiction, UCSD – La Jolla, CA June, 2012. "Oft Wrong, but Never in Doubt: Pascal's Wager in Everyday Cognition"

Honors Summer Math Camp Alumni Seminar, Texas State University San Marcos – San Marcos, TX
July, 2012. TBA

Society for Neuroscience Annual Meeting Nanosymposium "Neural Representation of Uncertainty" – New Orleans, LA
October, 2012. "Tracking changes in an uncertain world: Deriving optimal neuronal change-detection computations based on noisy sensory inputs from first principles"

Anniversary Symposium Invited Talk
Bernstein Center for Computational Neuroscience – Berlin, Germany
October, 2012. "To Go or Not To Go: Rational Impatience in Perceptual Decision-Making"

Institute for Neural Computation Chalk Talk
UCSD – La Jolla, CA
November, 2012. "Decisions! Decisions! Decisions!"

Biocircuits Institute Seminar
UCSD – La Jolla, CA
November, 2012. "To Spike or Not to Spike: Optimal Change-Detection in Single Neurons"

Neural Information Processing Systems Conference contributed talk – Lake Tahoe, NV
December, 2012. "Rational impatience in perceptual decision-making: A Bayesian account of discrepancy between two-alternative forced choice and Go/NoGo behavior"

CompNeuro Affinity Group Seminar
UCLA – Los Angeles, CA
February, 2013. "Decisions! Decisions! Decisions!"

"Main Speaker" at GCC Conference on Theoretical and Computational Neuroscience
Baylor College of Medicine, Rice University, University of Texas Houston, University of Houston – Houston, TX
February, 2013. "Decisions! Decisions! Decisions!"

Workshop Panelist
NSF Workshop on "Computational Cognition" – Arlington, VA
May, 2013. "Behavioral Control as Inference and Decision-Making"

Uncertainty in Artificial Intelligence Annual Conference contributed talk
Seattle, WA
July, 2013. "Active sensing as Bayes-optimal sequential decision-making"

Workshop on Prediction Errors in Cognition
Boston University – Boston, MA
July, 2013. "Inhibitory Control and Prediction Errors"

Cognitive Science Society Annual Conference contributed talk – Berlin, Germany
August, 2013. "A rational account of contextual effects in preference choice: What makes for a bargain?"

Seminar
Janelia Farm Research Campus – Ashburn, Virginia
September, 2013. "Neuronal Change-Detection"

Symposium on Uncertainty and Metacognition
Japanese National Institute for Physiological Sciences – Okazaki, Japan
October, 2013. Canceled due to illness.

Computational Neuroscience Seminar
EPFL – Lausanne, Switzerland
November, 2013. "Decision-Making in Perception and Action"

Behavioral Social Neuroscience Seminar
Caltech – Pasadena, CA
November, 2013. "Decision-Making in Perception and Action"

Symposium on Bayesian Applications in Cognitive Science
Annual Convention of the Association for Psychological Science – San Francisco, CA
May, 2014. "Learning and Decision-Making in Inhibitory Control"

Seminar
Army Research Laboratory, Adelphi, MD
June, 2014: "Value of Information in Humans: General Principles and Individual Differences"

Laboratoire de Neurosciences Cognitives Seminar
Ecole Normale Superieure, Paris, France
October, 2014: "Decision-Making in Perception and Action"

Group for Neural Theory Seminar
Ecole Normale Superieure, Paris, France
March, 2015: "Learning, Prediction, and Decision-Making in Human Active Sensing"

Transcontinental Computational Psychiatry Workshop
Web Conference
August, 2015. "Learning and Decision-Making in Inhibitory Control"

Affective Brain Lab Seminar
University College London, London, UK
January, 2016. "Statistical Learning and Decision-Making in Inhibitory Control: Neural Correlates and Psychiatric Impairments"

"Computational Models of Cognitive, Social, and Affective Processing" Workshop
Computational and Neural Systems Conference, Salt Lake City, UT
February, 2016. "A rational inference, learning, and decision- making model of inhibitory control in healthy behavior and stimulant abuse"

"Am I attending the right workshop? Certainty and confidence in decision-making" Workshop
Computational and Neural Systems Conference, Salt Lake City, UT
February, 2016. "Mismatched decision confidence and accuracy: Does it matter?"

Psychology Department Symposium
New York University, New York, NY
February, 2016. "Predicting the Unpredictable: Wisdom or Folly?"

Center for Theoretical Neuroscience Seminar
Columbia University, New York, NY
March, 2016. "Predicting the Unpredictable: Wisdom or Folly?"

6th Symposium on Biology of Decision-Making
Paris, London
May, 2016. "Change-Point Detection without the Need to Detect Change-Points"

Neurospin Seminar
NEC-Saclay, INSERM, Paris, France
May, 2016. "Predicting the Unpredictable: Wisdom or Folly?"

Seminar
University of Amsterdam, Amsterdam, The Netherlands
June, 2016: "Change-Point Detection without the Need to Detect Change-Points"

Gatsby Computational Neuroscience Unit Seminar
University College London, London, UK
June, 2016. "A Decision-Theoretic Framework for Active Cognition"

Center for Biological Learning Seminar
Engineering Department, Cambridge University, UK
June, 2016. "A decision-theoretic framework for active cognition"

Seminar
Oxford University, Oxford, UK
June, 2016: "Change-Point Detection without the Need to Detect Change-Points"

Institute of Intelligent Systems and Robotics Seminar
Université Pierre et Marie Curie, Paris, France
June, 2016. "A Decision-Theoretic Framework for Active Cognition"

Psychology Department Seminar
Université Catholique de Louvain, Brussels, Belgium
June, 2016. "A Decision-Theoretic Framework for Active Cognition"

CORTEX Conference
Institut des Sciences Cognitives, Lyon, France
June, 2016. "A Decision-Theoretic Framework for Active Cognition"

Group for Neural Theory Seminar
Ecole Normale Superieure, Paris, France
June, 2016. "Change-Point Detection without the Need to Detect Change-Points"

IST Lunch Brunch Seminar
Caltech, Pasadena, CA
October, 2016. "Predictably Rational: Human Decision-Making and Uncertainty"

Cognitive Brown Bag Seminar
Psychology Department, UCSD, San Diego, CA
October, 2016. "Predictably Rational: Human Decision-Making and Uncertainty"

"The Neural and Computational Construction of Confidence in Decision-Making" Symposium
Society for Neuroscience Annual Meeting, San Diego, CA
November, 2016. "The Neural and Computational Construction of Confidence in Decision-Making"

SSC Pacific Workshop on Naval Applications of Machine Learning
SPAWAR, San Diego, CA
January, 2017: "Change-Point Detection without the Need to Detect"

Kavli Summer Institute in Cognitive Neuroscience
UC Santa Barbara, Santabarbara, CA
July, 2017: "Learning and Decision-Making in Inhibitory Control"

SoCal Machine Learning Symposium Keynote
University of Southern California, Los Angeles, CA
October, 2017: "Computational Modeling of Human Face Processing"

UCSD AI Seminar
UCSD, La Jolla, CA
October, 2017: "Computational Modeling of Human Face Processing"

UCSD Social Brown Bag
UCSD, La Jolla, CA
November, 2017: "Computational Modeling of Human Face Processing"

UCSD Cognitive Brown Bag
UCSD, La Jolla, CA
December, 2017: "Toward a Computational Understanding of Human Face Processing"

Neural Information Processing Systems Workshop: Cognitively Informed AI
Long Beach, CA
December, 2017: "Computational Modeling of Human Face Processing"

"Cortical Codes" Workshop
EITN, Paris, France
February, 2018: "Computational Modeling of Human Face Processing"

Keynote
Mathematical Psychology Annual Meeting
Madison, Wisconsin
July, 2018: "Computational Modeling of Human Face Processing"

Keynote
Cognitive and Computational Neuroscience Symposium
UC Riverside, Riverside, CA
December, 2018: "Computational Modeling of Human Face Processing"

Seminar
Columbia University
New York, NY
December, 2018: "Computational Modeling of Human Face Processing"

UCLA Joint Seminar in Neuroscience
Los Angeles, CA
February, 2019: "Computational Modeling of Human Face Processing"

Sackler Colloquium of the National Academy of Sciences
"Brain Produces Mind by Modeling"
Irvine, CA
May, 2019: "Computational Modeling of Human Face Perception"

Cognitive Foundations of Economic Decisions
Vitznau, Switzerland
July, 2019: "Cognitive Modeling"

Gatsby Computational Neuroscience Unit Anniversary Symposium, UCL – London, UK
July, 2019: "Computational Modeling of Human Face Processing"

Computational Models of Behavior Summer School
Barcelona, Spain
September, 2019: "Sequential Effects and Reinforcement Learning" & "Computational Modeling of Human Face Processing"

UCSD Cognitive Brown Bag – La Jolla, CA
November, 2019: "Three wrongs make a right: reward underestimation mitigates idiosyncrasies in human bandit behavior"

UCSD Stochastic Processes Seminar – La Jolla, CA
February, 2020: "Human Learning & Decision Making under Uncertainty"

Invited Discussion Panelist "Natural vs. Artificial Intelligence"
Neurizons 2020 Conference – Virtual
May, 2020.

Computational Cognitive Neuroscience Seminar – Frankfurt, Germany" October, 2020: "Three wrongs make a right: reward underestimation mitigates idiosyncrasies in human bandit behaviour"

Baylor College of Medicine Neurosciences Seminar – Houston, TX
November, 2020: "Computational Modeling of Human Face Processing"

Princeton University Neurosciences Institute Seminar – Princeton, NJ
December, 2020: "Computational Modeling of Human Face Processing"

Computational Cognitive Neuroscience Seminar – Frankfurt, Germany
December, 2020: "Computational Modeling of Human Face Processing"

NYU/Flatiron Institute – New York, NY
April, 2021: "Computational Modeling of Human Face Processing"

Other Professional Activities

Editor for Journals:
Decision
Frontiers in Behavioral Neuroscience
Frontiers in Human Neuroscience (special issue)

Reviewer for Journals:
Adaptive Behavior
Brain Research
Cognition
Cognitive Psychology
Computational Brain & Behavior
Current Biology
Decision
eLife
European Journal of Neuroscience
Frontiers in Computational Neuroscience
Frontiers in Decision Neuroscience
Frontiers in Behavioral Neuroscience
Frontiers in Human Neuroscience
Journal of Autonomous Agents and Multi-Agent Systems
Journal of Neuroscience
Journal of Theoretical Biology
Memory & Cognition
Nature Communications
Nature Human Behavior
Nature Reviews
Neural Computation
Neuron
PLoS Computational Biology
PLoS ONE
PNAS
Psychological Review
Psychonomic Bulletin & Review
Psychopharmacology
Science

Reviewer for Conferences:
Cognitive Science Annual Conference (Cogsci)
Computational and Systems Neuroscience (CoSyNe)
International Joint Conference on Artificial Intelligence (IJCAI)
Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)
Neural Information Processing Systems (NIPS)

Reviewer for Grants:
NSF/NIH Collaborative Research in Computational Neuroscience
NSF Cognitive Neuroscience
NSF Computational Cognition
NSF Decision, Risk, and Management Sciences
NSF Decision, Risk, and Management Sciences Program
NSF Perception, Action, & Cognition NIH Brain Initiative
NIH Computational Psychiatry
NIH Drug Abuse

Conference, Workshop Organization

Neural Information Processing Systems Conference (NIPS) **Montreal, Canada**
December, 2019. Program committee member.

Neural Information Processing Systems Conference (NIPS) **Montreal, Canada**
December, 2018. Program committee member and senior area chair.

Neural Information Processing Systems Conference (NIPS) **Long Beach, CA**
December, 2017. Program committee member and area chair. Workshop organizer: "Cognitively informed AI"

Computational and Systems Neuroscience Annual Meeting (Cosyne) **Salt Lake City, UT**
February, 2014. Program committee member.

Neural Information Processing Systems Conference (NIPS) **Lake Tahoe, NV**
December, 2013. Program committee member and area chair.

Multidisciplinary Conference on RL and Decision Making **Princeton, NJ**
October, 2013. Program committee member and reviewer.

International Joint Conference on AI (IJCAI) **Beijing, China**
June, 2013. Program committee member.

Computational and Systems Neuroscience (CoSyNe) **Salt Lake City, UT**
February, 2013. Program committee member.

Neural Information Processing Systems Conference (NIPS) **Lake Tahoe, NV**
December, 2012. Program committee member and area chair.

Computational and Systems Neuroscience (CoSyNe) **Salt Lake City, UT**
February, 2010. Chair, Session on "Decision Making"

Psychonomic Society Annual Meeting **Houston, TX**
November, 2006. Chair, Session on "Visual Processing"

Society for Neuroscience Annual Meeting (SfN) **Washington, DC**
November, 2005 Workshop co-organizer (with Martin Sarter): "New Insights Into the Cellular Regulation and Cognitive Functions of Forebrain Cholinergic Neurotransmission"

Gatsby Computational Neuroscience Unit, UCL **London, UK**
February, 2004 Workshop co-organizer (with Peter Dayan): "Acetylcholine, Norepinephrine, Attention, and Uncertainty"

Neural Information Processing Systems (NIPS) **Whistler, BC, Canada**
December, 2003 Workshop co-organizer (with Sophie Deneve): "Neural Representation of Uncertainty"

Community Activities

Girls' Angle **Cambridge, MA**
2017 – 2018. A nonprofit organization aiming to "foster and nurture girls' interest in mathematics and empower them to be able to tackle any field no matter the level of mathematical sophistication", we are making videos to encourage girls (grades 5-12) to pursue a mathematical education.

University of California San Diego **La Jolla, CA**
2014. "Girls Day Out" Women in Computation panelist. Outreach and education program to encourage San Diego-area high school girls to get involved in computer science.

University of California San Diego **La Jolla, CA**
2012. Faculty panelist at Cognitive Science Student Association Conference.

University of California San Diego **La Jolla, CA**
2008-2010. Tango instructor for UCSD Argentine Tango Club.

Princeton University Post-doc Social Club **Princeton, NJ**
2006-2008. Founding president.

MIT Club of Princeton **Princeton, NJ**
2006-2008. Board of Trustees.

Skills & Interests

Languages: English (native), Chinese (native), French (conversational), German (conversational), Spanish (conversational) **Other**: Argentine tango, figure skating, salsa, piano, bridge, skiing, traveling