Nisheeth Srivastava

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Education

PhD, Computer Science, University of Minnesota, October 2012
Dissertation title: *A computational investigation of being in the world*
Advisor: Paul R Schrater

B.Tech, Electrical Engineering (minor in Physics), Indian Institute of Technology, Madras, 2007

Employment

Asst. Professor   Dept of Computer Science, IIT Kanpur
Kanpur, India   Dec 2016 -
Computational cognitive science, psychology & economics; applications to machine learning, AI and human factors research in CS.

Post-doc   Dept of Psychology, UCSD
La Jolla, CA   Feb 2014 - Nov 2016
Supervisor: Edward Vul. Building and testing computational models; multiple object tracking, cognitive foundations of economic behavior, influence of autonomic arousal on memory

Post-doc   HBCSE, TIFR
Mumbai, India   Dec 2013 - Jan 2014
Supervisor: Sanjay Chandrasekharan. Designing experiments and analyzing data for eye tracking experiments.

Grants

Testing the explanatory limits of limited value representations, 2017-2020, *DST CSRI Award* (Rs 40.4 lakhs total), with Narayanan Srinivasan

A predominantly auditory recommender system, *Tower Capital Research CSR*, (Rs 4 lakh), with Piyush Rai

How metrizable are similarity judgments? 2015-2016, *Google Research Award*, ($51,256 total), with Ed Vul

Cognitive foundations for economic microfoundations, 2013-2015, *Institute for New Economic Thinking* ($98,892 total), with Paul Schrater

Awards and distinctions

Cognitive Science Society's Computational Modeling Prize (2015)

Research fellowships: Research I Fellowship (2016-2019), Centrum Wiskunde en Informatica, Amsterdam (2008); Dept of Informatics, University of Edinburgh (2007); MPI für Biological Cybernetics, Tubingen (2006)

Travel awards: BIS 2019, NIPS 2014, ICML 2008

Publications

1. Umair Z Ahmed, Renuka Sindhgatta, **Nisheeth Srivastava** and Amey Karkare. Targeted Example Generation for Compilation Errors. Proceedings of ACM Conference on Automated Software Engineering (ASE), 2019.

2. Aditya Narayan Chandrasekaran, Narayanan Srinivasan and **Nisheeth Srivastava**. Memory of relative magnitude judgments informs absolute identification. Proceedings of ICCM 2019.

3. **Nisheeth Srivastava**. Evidence for effort prediction in perceptual decisions. Proceedings of CogSci 2019.

4. **Nisheeth Srivastava**. Decision-makers minimize regret when calculating regret is easy. Proceedings of CogSci 2019.

5. Homanga Bharadwaj and **Nisheeth Srivastava**. New tab page recommendations strongly concentrate web browsing to familiar sources. Proceedings of ACM WebSci 2019.

6. **Nisheeth Srivastava**. Measuring conceptual incongruity from text-based annotations. Proceedings of IHCI 2018.

7. Vasundhara Rakesh and **Nisheeth Srivastava**. Modelling metareasoning about decision thresholds in a perceptual learning task. Proceedings of ICCM 2018

8. Jeenath Rahaman, Harshit Agarwal, **Nisheeth Srivastava** and Sanjay Chandrasekharan. Mutable concepts and enactable analogies: how manipulatives help in learning area. *Cognitive Science*, 2018

9. **Nisheeth Srivastava** and Ed Vul. A simple model of recognition and recall memory. Proceedings of NIPS 2017.

10. **Nisheeth Srivastava** and Edward Vul. A rational analysis of marketing strategies. Proceedings of CogSci 2017

11. **Nisheeth Srivastava** and Narayanan Srinivasan. Intertemporal impulsivity can also arise from persistent failures of long-term plans: comment on Nettle & Pepper (2017) *Behavioral and Brain Sciences*, 2017

12. **Nisheeth Srivastava**, Johannes Müller-Trede, Paul Schrater and Edward Vul. Modeling sampling duration in decisions from experience. Proceedings of CogSci 2016

13. **Nisheeth Srivastava** and Edward Vul. Attention modulates spatial precision in multiple object tracking. *Topics in Cognitive Science*, January 2016

14. **Nisheeth Srivastava** and Paul R Schrater. Learning what to want: context-sensitive preference learning. *PLoS One*, 2015

15. **Nisheeth Srivastava** and Edward Vul. Choosing fast and slow: explaining differences between hedonic and utilitarian choices. Proceedings of CogSci 2015

16. **Nisheeth Srivastava** and Edward Vul. Attention dynamics in multiple object tracking. Proceedings of CogSci 2015

17. Sanjay Chandrasekharan, Geetanjali Date, Prajakt Pande Jeenath Rahaman, Rafikh Shaikh, Anveshna Srivastava, **Nisheeth Srivastava** and Harshit Agarwal. Seeing Eye to I: males recognize self, females inhibit recognition. Proceedings of Cog Sci 2015

18. **Nisheeth Srivastava**, Edward Vul and Paul R Schrater. Magnitude-sensitive preference formation. Proceedings of NIPS, 2014

19. **Nisheeth Srivastava** and Paul R Schrater. Classical conditioning via inference over observable situation contexts. Proceedings of CogSci 2014

20. **Nisheeth Srivastava** and Paul R Schrater. Frugal preference formation. Proceedings of CogSci 2014

21. Paul Freeman, Rohit Pandita, **Nisheeth Srivastava** and Gary Balas. Model-based and Data-driven Fault Detection Performance for a Small UAV. IEEE Transactions on Mechatronics, May 2013

22. Komal Kapoor, **Nisheeth Srivastava**, Jaideep Srivastava and Paul R Schrater. Measuring spontaneous devaluations in user preferences. Proceedings of KDD 2013

23. **Nisheeth Srivastava** and C Wade Savage. A structuralist view of metacognition in animals, Cognitive Critique, 2012

24. **Nisheeth Srivastava** and Paul R Schrater. Active inference with embodied cognitive limitations. Workshop on Information in Perception and Action, NIPS 2012

25. **Nisheeth Srivastava** and Paul R Schrater. Rational inference of relative preferences. Neural Information Processing Systems (NIPS) 25, 2012

26. Amogh Mahapatra, **Nisheeth Srivastava** and Jaideep Srivastava. Contextual anomaly detection for text data. Algorithms 2012, 5(4), 469-489.

27. Amogh Mahapatra, **Nisheeth Srivastava** and Jaideep Srivastava. Characterizing the Internet's sense of humor. In Proceedings of IEEE SocialCom/PASSAT, 2012

28. Amogh Mahapatra, **Nisheeth Srivastava** and Jaideep Srivastava (2012). Contextual Anomaly Detection In Text Data.Text Mining Workshop, Proceedings of the Twelth SIAM International Conference on Data Mining, Anaheim,CA, April 26-April 28

29. Prasanna Desikan, **Nisheeth Srivastava** et al. Early prediction of potentially preventable events in ambulatory care sensitive admissions from clinical data. Proceedings of the 2nd IEEE Health Informatics and Systems Biology Conference, 2012

30. Komal Kapoor, Christopher Amato, **Nisheeth Srivastava** and Paul Schrater. Using POMDPs to Control an Accuracy-Processing Time Tradeoff in Video Surveillance. Proceedings of the Twenty-Fourth IAAI Conference on Artificial Intelligence (IAAI-12), Toronto, Canada, July 2012

31. Saguna Dubey, Sandeep Sambaraju , Sarat C. Cautha, A. Parthasarathy, **N. Srivastava**, V. S. Chakravarthy, On the role of ambiguity in copying oriented line diagrams, International Journal of Brain, Mind and Cognition, 2011

32. **Nisheeth Srivastava** and Paul R Schrater. Cognitive efficiency as a causal mechanism for social preferences. In Proceedings of IEEE SocialCom/PASSAT, 2011

33. **Nisheeth Srivastava**, Komal Kapoor and Paul R Schrater. A cognitive basis for theories of intrinsic motivation. In Proceedings of IEEE International Conference on Development and Learning and Epigenetic Robotics, 2011

34. **Nisheeth Srivastava** and Paul R Schrater. A value-relativistic decision theory predicts known biases in human preferences. In Proceedings of the 33rd Annual meeting of the Cognitive Science Society (CogSci 2011)

35. **Nisheeth Srivastava** and Paul R Schrater. A predictive model for self-motivated decision-making behavior. Proceedings of BRIMS (2011)

36. **Nisheeth Srivastava** and Jaideep Srivastava. A hybrid-logic algorithm for fault detection in complex cyber-physical systems. Proceedings of PHM, (2010)

37. **Nisheeth Srivastava** and Pramod K Srivastava, Modeling the repertoire of true tumor-specific MHC I epitopes in a human tumor, PLoS One (2009)

38. Aleksandar Lazarevic, **Nisheeth Srivastava** et al. Theoretically optimal distributed anomaly detection. Proceedings of IEEE International Workshop on Mining Multiple Information Sources, International Conference on Data Mining (2009)

39. Sitabhra Sinha and **Nisheeth Srivastava** (2007), Is inequality inevitable in organized society? In Econophysics of Markets and Business Networks, Arnab Chatterjee & Bikas Chakrabarti (Eds.), Springer Milan Press

Working/archived manuscripts

Archit Sakhadeo and **Nisheeth Srivastava**, Effective extractive summarization using frequency-filtered entity relationship graphs, (2018) arXiv:1810.10419

Nisheeth Srivastava and Paul Schrater Learning what to want: data-driven microfoundations SSRN: http://ssrn.com/abstract=2526540.

Nisheeth Srivastava and Paul Schrater, An Evolutionarily Motivated Model of Decision-Making Under Uncertainty (2010) SSRN: http://ssrn.com/abstract=1687205

Nisheeth Srivastava, Evolvability need not imply learnability, (2009) arXiv:0904.0648

Nisheeth Srivastava, The relativity of theory, (2009) arXiv:0902.3479

Arindam Banerjee and **Nisheeth Srivastava**, Conditionally Positive Definite Kernels and Infinitely Divisible Distributions, TR08-034, Dept of CSE, University of Minnesota, 2008

Posters/Extended abstracts

1. Arjun Mitra, Narayanan Srinivasan and **Nisheeth Srivastava**, Planning failures induced by budgetary overruns cause intertemporal impulsivity. CogSci 2019

2. Rujuta Pimprikar and **Nisheeth Srivastava**. Probing mental representations that determine context-sensitive monetary reasoning. ACCS 2018

3. Vasundhara Rakesh and **Nisheeth Srivastava**. Modelling metareasoned decision threshold shifts in a random dot motion discrimination task. ACCS 2018

4. **Nisheeth Srivastava**. Similarity judgments for popular items are (almost) metrizable. ACCS 2017

5. **Nisheeth Srivastava**. Measuring part set cueing in web browser new tab displays. ACCS 2017

6. **Nisheeth Srivastava**. Memory of relative magnitudes judgments informs absolute identification. CogSci 2017

7. **Nisheeth Srivastava** and Edward Vul. Rationalizing subjective probability distortions. CogSci 2017

8. Rafikh Shaikh and **Nisheeth Srivastava**. Arithmetic training does not improve ANS acuity in primary school students. UNISA ISTE 2016

9. Anveshna Srivastava, **Nisheeth Srivastava** and Sanjay Chandrashekharan. Order of element placement in physical concept-mapping reveals differences in subject matter comprehension. Spatial Cognition 2016

10. **Nisheeth Srivastava**. The spiral of anxiety: a cognitive account. CogSci 2015

11. **Nisheeth Srivastava** and Edward Vul. Perceptual and cognitive limitations interact in multiple object tracking. VSS 2015

12. Anveshna Srivastava, **Nisheeth Srivastava** and Sanjay Chandrashekharan. Procedural analysis elucidates stages in students' understanding of biology concepts, Annual Meeting of the American Educational Research Association, Apr 2014.

13. **Nisheeth Srivastava** and Paul R Schrater. Classical conditioning via inference over observable situation contexts. CoSYNe 2014.

14. Paul R Schrater and **Nisheeth Srivastava**. How does the brain compute value? A rational model for preference formation. CoSYNe 2013.

15. Komal Kapoor, **Nisheeth Srivastava** and Paul R Schrater. Reconciling decisions from description with decisions from experience. CoSYNe 2013.

16. **Nisheeth Srivastava** and Paul R Schrater. Cognitive efficiency explains intelligence effects on risk sensitivity and temporal discounting. CoSYNe 2012.

17. N Marcus Thygeson, **Nisheeth Srivastava** and Jaideep Srivastava. Medical Office Visit Frequency Fits a Power Law Distribution Modified by Exponential Censoring. 21st Annual International Conference for the Society for Chaos Theory in Psychology and Life Sciences, August 4-6, 2011

18. Cognitively efficient need satisfaction: a novel intrinsic reward model explains multiple cognitive biases. Talk at 44th Annual Meeting of the Society for Mathematical Psychology, Medford, MA, Jul 2011

19. **Nisheeth Srivastava** and Paul R Schrater. A cognitive principle of least effort explains many cognitive biases. Comparative Decision Making conference, University of Kentucky, 13-15 May 2011

20. **Nisheeth Srivastava** and Paul R Schrater. Your choice models are wrong: a cognitively motivated decision theory predicts known cognitive biases. CoSYNe 2011.

21. **Nisheeth Srivastava** and Jaideep Srivastava. Adaptive dimensionality reduction for visualizing faults in complex systems. CIDU 2010

22. **Nisheeth Srivastava**, A Lazarevic, J Srivastava. Anomaly detection in complex networks. 3rd NASA Conference on Intelligent Data Understanding, 2009

23. Aleks Lazarevic, **Nisheeth Srivastava**, Jaideep Srivastava. Solving a prisoners' dilemma in distributed anomaly detection. 3rd NASA Conference on Intelligent Data Understanding, 2009

Invited talks/tutorials/panels

1. *The need for AI standards*, ICADABAI, IIM Ahmedabad, April 2019

2. *Where the ML hits the human*, CODS-COMAD, Jan 2019

3. *Human-centered artificial intelligence*,IIT BHU, Jul 2018

4. *Recognition and recall are simple consequences of content addressability in human memory*, CBCS Allahabad, Apr 2017

5. *Subjective probability distortions: mechanism and applications* , Dept of Computer Science, IIT Kanpur, Nov 2015

6. *Subjective probability distortions are caused by selective memory recall*, CBCS Allahabad, Oct 2015

7. *Where do preferences come from?*, INET-CIGI Conference, Hong Kong, April, 2013

8. *How does the brain create expectations? It's complicated.* Society of Complex Systems for Cognitive Science, 19th Jul, 2011

9. *Anomaly detection for medical devices*, Medtronic Inc., July 2010

10. *Information-theoretic observations on the calculus of variations*, 2nd International Workshop on Entropy, EPFL, Sept 8-10, 2008

11. *A road to optimal lossy compression*, Centrum Wiskunde en Informatica, Amsterdam, July 2008

Service

Coordinator, Workshop on *AI for defence applications* at Ordnance Factories, Kanpur, April 2019

Member, Study Group on Trustworthiness of AI systems, International Standards Organization JTC1/SC42

Member, Committee for standardization of Artificial Intelligence (Bureau of Indian Standards, LITD 30)

Program Committee: ACCS 2019, ACCS 2018, IJCAI 2018, CIKM 2016, SBP 2016, BRIMS 2014-15; ICAS 2014-16; IEEE SocialCom 2012

Referee for *Cognition, Cognitive Computation, PLoS One, JEP:HPP, IEEE Trans. Mechatronics, IEEE Computational Intelligence, IJITDM, Royal Society Open Sciences, Psychological Studies*

Reviewer for CogSci 2014-19, ICML 2008, 2019, NeurIPS 2019