Sabyasachi Shivkumar |
University of Rochester

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Education

Program	Institution	CGPA	Year of completion
Joint PhD in Brain & Cognitive Sciences and Computer Science (Advisor: Ralf Haefner)	University of Rochester	3.97/4*	2022
Dual Degree (B.Tech (Hons.) & M.Tech) in Electrical Engineering, Minor in Computational Biology	Indian Institute of Technology Madras, Chennai	8.81/10	2017

* After 9 Semesters

Publications

- **Shivkumar, S.**, Lengyel, G., DeAngelis, G. C. & Haefner, R. M. (*in prep.*). Causal inference in hierarchical motion perception

- **Shivkumar, S.**, Cappelloni, M. S., Maddox, R. K. & Haefner, R. M., (*in prep.*). Inferring sources of suboptimality in perceptual decision making using a causal inference task.

- Noel, J. P.*, **Shivkumar, S.***, Dokka, K.*, Haefner, R.[†], & Angelaki, D.[†] (2021). Aberrant causal inference and presence of a compensatory mechanism in Autism Spectrum Disorder. Link

- Lange, R. D., **Shivkumar, S.***, Chattoraj, A.*, & Haefner, R. M. (2021). Bayesian encoding and decoding as distinct perspectives on neural coding. bioRxiv, 2020-10 Link

- Levenstein, D., Alvarez, V. A., Amarasingham, A., ... & , **Shivkumar, S.** , ... & Redish, A. D. (2020). On the role of theory and modeling in neuroscience. arXiv preprint arXiv:2003.13825. Link

- Cappelloni, M. S., **Shivkumar, S.**, Haefner, R. M., & Maddox, R. K. (2020). Effects of auditory reliability and ambiguous visual stimuli on auditory spatial discrimination. bioRxiv. Link

- Cappelloni, M. S., **Shivkumar, S.**, Haefner, R. M., & Maddox, R. K. (2019). Task-uninformative visual stimuli improve auditory spatial discrimination in humans but not the ideal observer. Plos one, 14(9), e0215417 Link

- **Shivkumar, S.**, Chakravarthy, V. S., & Rougier, N. P. (2018). Modeling the Role of the Striatum in Non-Stationary Bandit Tasks. bioRxiv, 196543. Link

- **Shivkumar, S.**, Muralidharan, V., & Chakravarthy, V. S. (2017). A biologically plausible architecture of the striatum to solve context-dependent reinforcement learning tasks. Frontiers in neural circuits, 11, 45 Link

Conference Proceedings

- **Shivkumar, S.**, Penaloza, B., Lengyel, G., DeAngelis, G. C. & Haefner, R. M. (VSS 2022, Talk). Causal inference underlies hierarchical motion perception

- **Shivkumar, S.**, Xu, Z., Lengyel, G., DeAngelis, G. C. & Haefner, R. M. (COSYNE 2022). Causal inference can explain hierarchical motion perception and is reflected in neural responses in MT

- Chattoraj, A. *, **Shivkumar, S.***, Ra, Y. S. & Haefner, R. M. (VSS 2022, Talk). Eye-movements during active sensing suffer from a confirmation bias

- Chattoraj, A. *, **Shivkumar, S.***, Ra, Y. S. & Haefner, R. M. (SFN 2021). A confirmation bias during the active seeking of new perceptual evidence across saccades

- **Shivkumar, S.**, DeAngelis, G. C. & Haefner, R. M. (SFN 2021). Causal inference in hierarchical motion perception

- Xu L.*, **Shivkumar, S.***, DeAngelis G. C., Haefner R. M. (Bernstein 2021) A normalization model for hierarchical motion perception

- Chattoraj, A. *, **Shivkumar, S.***, Ra, Y. S. & Haefner, R. M. (COGSCI 2021, Talk). A confirmation bias due to approximate active inference

- **Shivkumar, S.**, DeAngelis, G. C. & Haefner, R. M. (VSS 2020, Talk) A causal inference model for the perception of complex motion in the presence of self-motion

- **Shivkumar, S.**, Cappelloni, M. S., Maddox, R. K., Haefner & R. M. (Bernstein 2019) Approximate causal inference based cue integration

- **Shivkumar, S.**, DeAngelis, G. C. & Haefner, R. M. (CCN 2019) A causal inference model for the perception of complex motion in the presence of self-motion

- **Shivkumar, S.***, Lange, R. D. *, Chattoraj, A.* & Haefner, R. M. (NeurIPS 2018, Talk). A probabilistic population code based on neural samples Link

- **Shivkumar, S.**, Cappelloni, M. S., Maddox, R. K. & Haefner, R. M. (CCN 2018). Approximate inference explains paradoxical data in two-event causal inference task Link

- **Shivkumar, S.**, Muralidharan, V., & Chakravarthy, V. S. (OCNS 2016). 'A computational architecture to model the microanatomy of the striatum and its functional properties', in BMC Neuroscience 2016, 17(Suppl 1):P189

HONORS AND AWARDS

- 2020 Edward Peck Curtis Award for Excellence in Teaching by a Graduate Student

- VSS 2020, Bernstein 2019,NeurIPS 2018 travel grant awardee

- CVSS 2019 summer school attendee (Black Forest, Germany)

- NSF Future Frameworks of Theoretical Neuroscience workshop 2019 attendee

- CRCNS 2018 summer school attendee (University of California Berkeley)

- NSF National Research Training (NRT) Fellowship, University of Rochester

TEACHING EXPERIENCE

- **Teaching Assistant + Guest lectures** : Animal Minds, Topics in Computational Neuroscience, Neuropsychology, Undergraduate research in Cognitive Science (University of Rochester); Advanced Electrical Engineering Lab, Applied Programming Lab (IIT Madras)

OUTREACH

- Presented at Taste of Science in San Antonio, a program which aims to bring scientific literacy to the adult population

- Taught english for communication for underprivileged children in India from grades 6 to 8

PROFESSIONAL EXPERIENCE

- Healthcare Technology Innovation Centre(HTIC)   (2014)

- Dhvani Research-IITM Research Park   (2013)

MISCELLANEOUS PROJECTS

- Brain Computer Interface using Covert Attention via SSVEP signals (Supervised by Prof. Sridharan Devarajan) (2015)

- Robotic Arm catching a ball(Reinforcement Learning Course Project)   (2015)

- Air Hockey Playing Robot (as part of Young Innovator's Program Centre for Innovation(CFI), IIT Madras) (2013)

- Image Based Augmented Reality using Opencv   (2013)

POSITIONS OF RESPONSIBILITY

- Organized lunch talks for department graduate students (UoR)   (2019)

- Student-in-charge of Electrical Engineering Association (IIT Madras)   (2015)

- Editor Chennai36, The Alumni Blog of IIT Madras   (2015)