

Tanvi Ranjan

Neuromotor Control Lab at Harvard
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📄 <https://github.com/tanviranjan2212>

Research Interests

Motor learning, Computational Neuroscience, Statistical modelling

Education

- 2016–2022 **Ph.D.**, *Applied Math*, Harvard University, Cambridge, MA, USA.
Focus: Neuromotor adaptation
Supervisor: Maurice Smith
- 2011–2016 **Bachelors of Technology**, *Electronics and Electrical Communication Engineering*, Indian Institute of Technology, Kharagpur.
GPA – 9.5/10.

Work Experience

- May - Aug **Research intern**, Facebook Reality Labs.
2021 Formulated metrics for usability of neural interfaces
- May - Aug **Research intern**, IBM Research.
2014 Worked on Smarter Grid solutions team

Research Experience

- Jan 2021 - **Research Assistant**, Digital Psychiatry Division, Beth Israel Deaconess Medical Center.
present
Advisor: John Torous
Relapse prediction in patients with Schizophrenia.
- Jan 2017 - **Graduate Research**, School of Engineering and Applied Sciences, Harvard University.
present
Advisor: Maurice Smith
Behavioural motor learning from errors in motor actions.
- May - July **Undergraduate summer research**, Department of Physics, Massachusetts Institute of Technology.
2015
Advisor: Jeff Gore
Oscillatory dynamics of microbial populations in a mutualism environment
- June 2014 - **Undergraduate Research**, Department of Electronics and Electrical Communication Engineering.
June 2016
Advisor: Ritwik Layek
Modelling bacterial population growth using evolutionary game theory

Publications

- 2021 **T. Ranjan**, J. Melcher, M. Smith, J. Torous. *Assessing relationships between mental health and passive features via smartphone apps*, under review
- 2020 **T. Ranjan** and M. Smith. *Cancellation of internally generated errors from the signal driving motor adaptation*, in submission

- 2018 S. Gokhale*, A. Conwill*, **T. Ranjan**, J. Gore. *Migration alters oscillatory dynamics and promotes survival in connected bacterial populations*, Nature Communications
- 2016 J. Banerjee, **T. Ranjan**, R. Layek. *Stability Analysis of Population Dynamics Model in Microbial Biofilms with Non-participating Strains*, 7th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics
- 2015 J. Banerjee, **T. Ranjan**, R. Layek. *Dynamics of Cancer Progression and Suppression*, 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)

Conferences

- 2020 Conference talk: **Tanvi Ranjan** and Maurice Smith *Implicit motor adaptation is driven by motor performance prediction error, rather than sensory prediction error*, Advances in Motor Learning and Motor Control (MLMC)
- 2020 Poster: Sunandha Srikanth*, Frances Cho*, Jun Ye*, **Tanvi Ranjan***, Maxym V Myroshnychenko *Discrete and continuous dynamics of neural state space during decision making*, Bernstein conference
- 2019 Poster: **Tanvi Ranjan** and Maurice Smith. *Elimination of the internally generated component of error from the teaching signal for motor adaptation*, Society for Neuroscience (SfN)
- 2018 Conference Talk: **Tanvi Ranjan** and Maurice Smith. *Cancellation of internally generated errors from the signal driving motor adaptation*, Advances in Motor Learning and Motor Control (MLMC)
- 2017 Poster: **Tanvi Ranjan** and Maurice Smith *Dissecting motor variability into accumulating and non accumulating components*, Society for Neuroscience (SfN)

Teaching Experience

- Spring 2021 Grader for Decision Theory, Harvard University
- Spring 2019 Teaching assistant for Decision Theory, Harvard University
- Fall 2017 Teaching assistant for Science and Cooking, Harvard University
- Fall 2015 Teaching assistant for Electrical Networks, IIT Kharagpur

Relevant coursework

- Computation Probability, Bayesian Data Analysis, Decision Theory, Introduction to Disordered Systems, Neural Computation (Harvard), Statistical Mechanics (MIT), Computational Neuroscience (online Neuromatch Academy)
- Neuroscience Neurobiology (Harvard Medical School), Neural Control of Movement (Harvard)

Technical Skills

MATLAB, PYTHON, R, JAVA, C++