# Tanvi Ranjan

*Neuromotor Control Lab at Harvard*
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## 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 2021 **Research intern**, Facebook Reality Labs.
Formulated metrics for usability of neural interfaces

May - Aug 2014 **Research intern**, IBM Research.
Worked on Smarter Grid solutions team

## Research Experience

Jan 2021 - present **Research Assistant**, Digital Psychiatry Division, Beth Israel Deaconess Medical Center.
Advisor: John Torous
Relapse prediction in patients with Schizophrenia.

Jan 2017 - present **Graduate Research**, School of Engineering and Applied Sciences, Harvard University.
Advisor: Maurice Smith
Behavioural motor learning from errors in motor actions.

May - July 2015 **Undergraduate summer research**, Department of Physics, Massachusetts Institute of Technology.
Advisor: Jeff Gore
Oscillatory dynamics of microbial populations in a mutualism environment

June 2014 - June 2016 **Undergraduate Research**, Department of Electronics and Electrical Communication Engineering.
Advisor: Ritwik Layek
Modelling bacterial population growth using evolutionary game theory

## Publications

2021 **T. Ranjan**, M. Smith, J. Melcher, M. Keshavan, J. Torous *Longitudinal symptom changes and association with home time in people with schizophrenia: an observational digital phenotyping study*, 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++