Ankani Chattoraj

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EDUCATION

• **Doctor of Philosophy (PhD), Brain and Cognitive Sciences** **September 2015 - August 2021 (expected)**
University of Rochester, Rochester, USA
• **Masters of Science, Applications of Mathematics (2nd in class)** **August 2012 - August 2014**
Chennai Mathematical Institute, Chennai, India
• **Bachelors of Science, Mathematics (Minor: Statistics and Computer Science)** **July 2009 - July 2012**
St. Xavier's College, Kolkata, India

EXPERIENCE

GRADUATE RESEARCH ASSISTANT **University of Rochester (2015 - 2021)**

• Designed >7 varieties of psychophysics visual experiments using Psychtoolbox of MATLAB and EYELINK eye tracker to understand confirmation bias, forgetful bias, action selection bias, confidence judgements in perceptual decision making.
• Modeled perceptual biases in human behavior as a consequence of sampling-based approximate inference on a hierarchical generative model of the world that the brain has previously learnt, implemented using MATLAB.
• Analyzed human behavioral data of >100 subjects across 12 experiments using regression, significance testing, cross validation, bootstrapping, regularization etc.
• Implemented a network of >100 leaky integrate-and-fire neurons in BRIAN and Python to test neural sampling hypotheses and demonstrated how biophysically realistic neurons can perform Gibbs sampling based probabilistic inference on a sparse linear Gaussian model of retinal input.
• Developed first of a kind fair rating predictor system for public speaking with respect to speakers' race and gender, using counterfactual fairness and causal models on a corpus of 2383 TED talk data.
• Led 3 end to end research projects: formulated testable scientific hypotheses, designed experiments, executed the experiments on human subjects and collected data, analyzed the data using statistical and mathematical tools and finally modeled empirical observations using concepts from machine learning.
• Collaborated with researchers from Mathematics, Computer Science and Social Sciences in 3 projects for social good such as building fair prediction models and crime data analysis: **UP-STAT 2018** (3rd in data competition) and **AAAI 2020** (oral).
• Presented and published in scientific conferences: **CogSci 2021** (oral), **NEUROMATCH 2020**, **VSS 2020**, **CCN 2019**, **Bernstein 2019**, **COSYNE 2018**, **COSYNE 2017** and **ICLR Workshops**, **AAAI 2020**, **NeurIPS 2018** (oral), **NIPS 2015**.

TEACHING ASSISTANT/MENTORING

• **Courses**: •Neural mechanisms of behavior, Fall 2016, 2017, University of Rochester, USA •Action and Perception, Fall 2018, University of Rochester, USA •Undergraduate Research in Cognitive Science, Fall 2018 - Spring 2019, Fall 2019 - Spring 2020, University of Rochester, USA •Machine Learning, Spring 2015, Chalmers University of Technology, Sweden.
• **Role:** Organized weekly revision lectures for a class of ~200 students, trained 4 undergraduate TAs, gave 2 class lectures on neural mechanisms of visual illusions, graded examinations and organized guidance sessions for coding assignments.
• **Mentoring:** Advised 7 undergraduates at University of Rochester (2015-2021) leading to 5 conference submissions.

INTERNSHIPS/SUMMER SCHOOLS

•Summer course in mining and modeling neuroscience data at **UC Berkeley, USA (CRCNS 2017)**: Fit general linear models and applied dimensionality reduction (PCA) on neuronal data, implemented in Python.
•Summer School in Computational Sensory-Motor Neuroscience at **University of Minnesota, USA (CoSMo 2017)**: Designed experiments and modeled biological motion perception in humans using MATLAB (2nd in project competition).

SKILLS & COURSEWORK

PROGRAMMING LANGUAGE: MATLAB, Python.
TECHNICAL SKILLS:
• **Experiments**: Design Experiments, Implement Psychophysical and Eye-tracking Experiments, Data Collection.
• **Modeling**: Hierarchical Generative Models, Probabilistic Inference, Bayesian Inference, Approximate Inference, MCMC Methods, Causal Model, Counterfactual Fairness, Biological Neuron Model, Model Fitting, Model Comparison.
• **Analysis**: Logistic, Ordinal, and Linear regression, Statistical Analysis, Optimization, Hypothesis testing, Significance testing, Cross Validation, Hyperparameter Search, Regularization, Bootstrapping, Supervised Learning, Deep Learning, PCA.
RELEVANT COURSEWORK:
• **Neuroscience/Cognitive Science**: Sensory Systems, Computational Neuroscience, Visual Perception, Cognition.
• **Computer Science**: Discrete Mathematics, Algorithms, Data Mining, Machine Learning.
• **Mathematics**: Linear Algebra, Calculus, Real and Complex Analysis, Topology, Probability and Statistics.

LEADERSHIP EXPERIENCE

• Cultural Secretary of BAGR **(Bengali Association of Greater Rochester)** **Summer 2018 - Spring 2019**
• Organized a national level annual seminar at St Xavier's College **(ANALYTICA)** **2009, 2010 and 2011**
• Organized an annual collegiate festival at Chennai mathematical Institute **(FIESTA)** **2013**