

# Shouman Das

585 363 1349 • anumoshad@gmail.com • website: [anumoshad.github.io](https://anumoshad.github.io)

LinkedIn: <http://www.linkedin.com/in/shouman-das-91724245>, GitHub: <https://github.com/anumoshad>

## EDUCATION

### University of Rochester

PhD in Mathematics

Relevant coursework: Machine Learning, Probability and Statistics, Data Mining, Linear Algebra, Calculus, Topology, Financial Math, Statistical Modeling, Intermediate Statistics

Rochester, NY

Anticipated 2020

### The University of Tokyo

BSc in Mathematics

Tokyo, Japan

2014

## SKILLS

- **Programming Languages:** Competent in Python, R, Familiar with C, Java
- **Computing Toolkit:** MATLAB, Mathematica, Pytorch, Scikit
- **Foreign Language:** Fluent in Japanese, Bengali

## SELECTED PROJECTS

### *Fair Rating Predictor for Ted Talk Data:*

Fall 2019

Incorporated causal model and counterfactual fairness to a neural network on the Ted talk data whose prediction is counterfactually fair. We create our model using well-known toolkits pymc3 and pytorch.

### *Kaggle Data Science Competition:*

Spring 2017

In a team of two, used feature engineering, LASSO, XGBoost to make prediction model on a “House Prices” dataset. Our prediction model had an error of 0.11676 which was in the top 300 teams among 2500.

### *Data Science Capstone Project:*

Fall 2017

Developed a Shiny app for text prediction using R as part of a Data Science Specialization course offered by Coursera. Used a simplified version of Katz Back-off Model to predict the next word while typing. (Web: [https://anumoshad.shinyapps.io/coursera\\_capstone\\_version1/](https://anumoshad.shinyapps.io/coursera_capstone_version1/))

*Predicting Cognition Impairment in Parkinson's Disease:* In a team of two, used Python (Scikit) and R to make different statistical models (KNN, LASSO, Ridge regression, gradient boosting method etc.) for cognition impairment of Parkinson's patients.

### *Data Analysis:*

Fall 2016

*Analyzing Correlation between Student Attitude and Success:* Collected data from a freshman calculus class of 62 students. Preprocessed, cleaned and analyzed the raw data to find the correlation between attitude and success.

## SELECETED PUBLICATIONS/MANUSCRIPT

- **Das, S. (2018). Genus of Hypercube Graph and Real Moment Angle Complex**, Topology and its Applications, Volume 258, 2019, Pages 415-424, ISSN 0166-8641, <https://doi.org/10.1016/j.topol.2019.03.009>. Fall 2018
- **Shouman Das, S A Haque, R Acharyya, M. I Tanveer. Persistence Homology of TEDtalk: Do Sentence Embeddings Have a Topological Shape?** (under review). Fall 2019
- **R Acharyya, Shouman Das, A Chattoraj, M. I Tanveer. FairyTED: A Fair Rating Predictor for TED Talk Data.** (accepted at AAAI 2020 AI for Social Impact). Fall 2019
- **R Acharyya, Shouman Das, K. Hasan, A. Chattoraj, M. I. Tanveer and E. Hoque. Fairness in Rating Prediction by Awareness of Verbal and Gesture Quality of Public Speeches** (Under review). Spring 2019
- **R. Acharyya, B. Zhang, Shouman Das, Daniel. Štefankovič. Understanding Diversity based Edge and Node Pruning of Neural Networks** (Under review). Spring 2019

## EXPERIENCE

### Adjunct Math Instructor, University of Rochester

Summer 2016-19

- Organized the syllabus of multiple courses, and executed the lectures and class activities in a planned manner.
- Facilitated learning in classrooms with an average of 15 students.

### Proctoring and Tutoring:

September 2017 - 2019

- Implement a safe and fair exam environment as a proctor for the disability and resources center
- Instruct students in a 1-on-1 setting as a tutor for the Center for Excellence in Teaching and Learning (CETL).

### Workshop Leader:

Fall 2015

- Guided students to develop problem-solving abilities and conceptual understanding in undergraduate calculus classes.

## PROFESSIONAL DEVELOPMENT

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**Actuarial Exam: Probability, Financial Mathematics, Models for Financial Economics**

**Online Courses:**

- **Data Science Specialization** - 10 courses including machine learning, statistical inference, regression models etc.
- **Deep Learning Specialization** - Andrew Ng's 5-courses
- **Data Structures and Algorithms Specialization** - completed 5-courses

## EXTRACURRICULAR ACTIVITIES/ AWARDS

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**Problem Solver at <https://projecteuler.net/>** **2009-present**  
Solved 225+ challenging computational problems (top 0.172% among 867,815 solvers).

**University of Rochester, Badminton Club** **Fall 2017-present**  
Active member of the university badminton club. Took part in multiple badminton tournaments near Rochester, NY.

**University of Tokyo Cricket Club** **2011-2014**  
Active member of the university cricket team. Participated in the inter-varsity cricket championship.

**Japanese Govt. Scholarship (MEXT scholarship)** **2009-2014**  
Recipient of scholarship from Japanese government for my undergraduate studies.

**High School Math Olympiads** **2004-2007**  
National High School Math Champion. Competed in the **International Math Olympiad** from Bangladesh.

**Interests:** Soccer, Table Tennis, Hiking, Running, Bicycling, Volunteering.