

Shorya Consul

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🌐 <https://shoryaconsul.github.io/>

Education

University of Texas at Austin, Austin, Texas
MS/PhD in Electrical and Computer Engineering

Aug 2017 - Present

- **GPA:** 4.0/4.0
- Enrolled in bioECE track

Indian Institute of Technology Bombay, Mumbai, India
B.Tech in Electrical Engineering with Honours

Jul 2013 - May 2017

- **Major CPI:** 9.86/10
- **Minor** in Computer Science and Engineering
- Ranked **1st** in department

Internships

ARM Research, Austin, Texas
Data & AI Services Team

Summer 2020

- Abstracted the problem of targeting advertising based on ad clicks
- Developed an variational autoencoder and reinforcement learning-based approach to improve funneling

CognitiveScale, Austin, Texas
Machine Learning Team

Summer 2019

- Developed an AI risk assessment tool for regression
- Tool scores black-box models on metrics such as explainability and fairness
- Placed **first** among interns for internal Shark Tank competition on products for responsible AI

Research Experience

Differentially Private Median Forests

Prof. Sinead Williamson, Statistics, UT Austin

July 2019 - June 2020

- Devised a novel learning scheme for decision forests that guarantees differential privacy or
- Proposed method can consume mixed features, and can be used for regression and classification
- Derived utility bounds for proposed scheme as a function of hyperparameters of decision forest

Reconstructing Intra-tumor Heterogeneity via Convex Optimization and Branch-and-Bound Search

Prof. Haris Vikalo, ECE, UT Austin

May 2018 - present

- Formulated problem as the minimization of a squared error cost function
- Tumor fractions and copy numbers in each tumor strain identified via alternating minimization
- Developing a pipeline that can improve performance by using SNP information

Nonparametric Bayesian Genotype Imputation with Error Correction

Prof. Haris Vikalo, ECE, UT Austin

Jan 2018 - present

- Utilized a categorical IBP prior to model genotype panels with a ternary alphabet
- Adopted a confusion matrix as error model for reads with a random mask to simulate missing entries
- Devised a MCMC sampler to derive estimates of error rates and true genotype panel

Analysis and Development of Techniques for Foetal Heart Rate Estimation from US Doppler Signals

Prof. Preeti Rao, EE, IITB

July 2016 - May 2017

- Studied and modified existing methods for foetal heart rate (FHR) measurement from US Doppler signals
- Compared them to FHR measurements from commercially available machines
- Targeted the development of a low-cost alternative to existing apparatus

Publications

- S.Consul,S. Williamson, **Differentially Private Median Forests for Regression and Classification**, *Preprint*
- S. Consul,H. Vikalo, **Reconstructing Intra-Tumor Heterogeneity via Convex Optimization and Branch-and-Bound Search**. *ACM-BCB 2019*
- S. Consul,A. Hashemi,H. Vikalo, **A MAP Framework for Support Recovery of Sparse Signals Using Orthogonal Least Squares**. *ICASSP 2019*

Academic Projects

Uncovering User Data in Federated Learning

EE 381V: Fair/Transparent Machine Learning

Guide: Prof. Joydeep Ghosh, ECE, UT Austin

Spring 2019

- Used influence functions to glean information about training data in a federated setting
- Method seems effective with simple datasets but does not give clear results with more complex datasets

MAP Framework for Support Detection Using OLS

EE 381K: Estimation Theory

Guide: Prof. Haris Vikalo, ECE, UT Austin

Fall 2017

- Devised a framework to extend the Orthogonal Least Squares (OLS) method to guarantee optimality of derived support set in the MAP sense
- Compared devised method to OLS and other existing algorithms for support detection

Automatic Playlist Continuation

EE 380L: Data Mining

Guide: Prof. Joydeep Ghosh, ECE, UT Austin

Spring 2018

- Implemented variations of collaborative filtering and matrix factorization to rank songs
- Utilized subset of dataset released for from Spotify Challenge 2018
- Explored the use of item-item embeddings and metadata to improve performance

Achievements and Awards

- Recipient of **four-year fellowship** from University of Texas at Austin Graduate School
- Awarded **Institute Silver Medal** for being ranked 1st in the graduating EE batch at IIT Bombay
- Received **Prof. K.C. Mukherjee Award** for the best final year project at IIT Bombay
- Recipient of **Institute Academic Prize** for the academic years 2013-14 and 2015-16
- Awarded **AP grade** in *Computer Programming, Digital Systems, Signals and Systems* and *Control Systems*
- **Urvish Medh Memorial Prize** in 2016 for standing 1st in the department

Skills

- Proficient in Python, MATLAB, C++, L^AT_EX, Bash, PyTorch and Tensorflow
- Comfortable with both Windows and Unix (Ubuntu)
- Great team skills and problem-solving ability
- Fluent in English and Hindi

Key Courses Taken

Statistical Machine Learning, Deep Learning Seminar, Large Scale Optimization, Genomic Signal Processing, Fair & Transparent Machine Learning, Monte Carlo Methods, Reinforcement Learning, Data Mining, , Estimation Theory

Other Experience

President

UT Austin

GREECE (Graduate ECE)

Spring 2020

- Hosted companies for technical talks and organized graduate student socials
- Managed transition to new executive board at end of tenure

Vice-President

UT Austin

GREECE (Graduate ECE)

Fall 2019

- Founding member of graduate student organization within ECE department
- Aim to foster a sense of community among ECE students and serve as a forum for networking with industry

Teaching Assistant

Digital Signal Processing, Introduction to Automatic Control

*UT Austin
Fall 2017, Fall 2018, Spring 2019*

- Holding regular office hours to clarify doubts and homework
- Designing and grading homeworks and examinations

Teaching Assistant

Partial Differential Equations

*IIT Bombay
Autumn 2015, 2016*

- Taught and resolved doubts for a class of approximately 60 students
- Assisted in formulating the examinations for the course, and aided in the logistics and grading