

Shorya Consul

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EDUCATION

The University of Texas at Austin

PhD in Electrical and Computer Engineering

- Advisor: Haris Vikalo

Austin, TX

Expected: May 2024

The University of Texas at Austin

M.S. in Electrical and Computer Engineering

- GPA: 4.0 / 4.0

Austin, TX

December 2023

Indian Institute of Technology Bombay

B.Tech in Electrical Engineering (Minor in Computer Science)

- Institute Silver Medallist
- GPA: 9.86 / 10

Mumbai, India

May 2017

SKILLS

Technical: Python, C++, MATLAB, Bash, PyTorch, Tensorflow, Samtools

Soft: Collaboration, Enterprise, Fast learner

INDUSTRY EXPERIENCE

CognitiveScale

Machine Learning Team

Jun - Aug 2019

Austin, TX

- Developed an AI risk assessment tool to score black-box regression models on 4 metrics, including explainability and fairness. This has been productionized in Cortex [CERTIFAI](#), leading to over \$2 million in revenue.
- Interacted with industry stakeholders and proposed a responsible AI framework for insurance. Team placed **first** in company-wide Shark Tank competition on products for responsible AI.

ARM Research

Data & AI Services Team

May - Aug 2020

Austin, TX

- Conducted extensive literature review on recommendation systems, focusing on methods to improve funneling.
- Proposed a formulation comprising a variational autoencoder (VAE) to encode advertisement slates, prior to using reinforcement learning to improve funneling for ad clicks.

RESEARCH

Haplotype Assembly using Long-distance Read Correlations Learned by Transformer

Nov 2021 – Oct 2023

- Pioneered a transformer-based approach, XHap, for reference-based haplotype assembly from sequencing reads. XHap infers a **40% richer** correlation structure and reconstructs **> 300× longer** haplotypes accurately.
- Incorporated parallelization across **4 GPUs** and preprocessed data using Bash and C++ scripts for benchmarking XHap on **> 100GB** of human sequencing reads.

Transformer-based Oncoviral Read Identification from Cancer Samples

Jun 2023 – Present

- Led the development of a pipeline in PyTorch (XVir) for oncoviral read identification through the use of a transformer-based classifier, achieving **99% accuracy**.
- XVir trains **> 8× faster** than SOTA methods and robust to as much as **15% diversity** in the oncoviral families.

Differentially Private Median Forests

July 2019 - Jun 2020

- Proposed a median-based approach to construct differentially private decision trees to privacy-preserving noise in the splits and node statistics.
- The superior accuracy of the designed approach was validated with error bars over **10 datasets** for both regression and classification and **10+ hyperparameter settings**.

Reconstructing Intra-tumor Heterogeneity via Convex Optimization

Sept 2018 - May 2019

- Formulated the problem of copy number inference in tumors as **matrix factorization**.
- Designed computationally efficient and accurate approach in MATLAB that sped up inference almost **10×**.

LEADERSHIP

Graduate ECE (GREECE)

President

May - Dec 2019

- Established transition processes for recruitment into the GREECE leadership team.
- Continued fundraising through industry talks and networking events, totalling upwards of **10,000**.

Officer

Jan 2018 – Nov 2019

- Established the **first** graduate student organization in the ECE department at UT Austin.
- Raised over \$6,000 from industry partners and orgnaized **10+** technical and social events for graduate students.

Mentorship

- Guided 2 students in the development of computational approaches for inference for cancer and viral analyses.
- Served as peer mentor to 6 new graduate students to help with acclimitization to graduate school.
- Mentored a sophomore for a year to assist him in coping with academic coursework.

AWARDS

- 2017 Awarded **four-year fellowship** from the Graduate School at The University of Texas at Austin.
- 2017 Conferred the **Institute Silver Medal** for ranking **1st** in department at IIT Bombay.
- 2017 Received Prof. K.C. Mukherjee Award for the best senior thesis.
- 2016 Awarded Urvish Medh Memorial Prize for **top** academic performance in institute.
- 2016 Awarded Institute Academic Prize for placing in the **top 3** of the department.
- 2014 Awarded Institute Academic Prize for or placing in the **top 10** among 880 freshmen.
- 2013-2016 Earned AP grade for outstanding performance in **three** courses.
- 2013 Achieved All India Rank of **115** in IIT-JEE (Main) and **388** in IIT-JEE (Advanced).
- 2012 Accorded the highly competitive KVPY scholarship by the Department of Science and Technology, India.

PUBLICATIONS

- Consul, Shorya et al. (2023). “XHap: haplotype assembly using long-distance read correlations learned by transformers”. In: *Bioinformatics Advances* 3.1, vbad169.
- Consul, Shorya et al. (2023). “XVir: A Transformer-Based Architecture for Identifying Viral Reads from Cancer Samples”. In: *bioRxiv*, pp. 2023–08.
- Consul, Shorya et al. (2021). “RF-based Network Inference: Theoretical Foundations”. In: *MILCOM 2021-2021 IEEE Military Communications Conference (MILCOM)*. IEEE, pp. 291–296.
- Consul, Shorya et al. (2020). “Balance is key: Private median splits yield high-utility random trees”. In: *arXiv preprint arXiv:2006.08795*.
- Consul, Shorya et al. (2019). “A Map Framework for Support Recovery of Sparse Signals Using Orthogonal Least Squares”. In: *ICASSP 2019-2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, pp. 5127–5131.
- Consul, Shorya et al. (2019). “Reconstructing intra-tumor heterogeneity via convex optimization and branch-and-bound search”. In: *Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics*, pp. 524–529.