Aneesh Shetty

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Education

The University of Texas at Austin — *GPA: 4.0 / 4.0*
MS in Computer Science | Fully Funded Research Assistantship in RL and Verification for Robotics — *Expected May 2024*
Courses: *Advanced OS and Virtualization, Natural Language Processing, Compilers*

IIT Bombay — *GPA: 9.27 / 10*
B.Tech in Computer Science and Engineering (Hons.) | Minor in Applied Statistics — *Graduated Jun. 2021*
Courses: *Deep Learning, Theoretical Computer Science and Reinforcement Learning*

Industry and Research Experience

Adobe - Document Cloud — *Noida, India*
Software Development Engineer — *Jul. 2021 - Jul. 2022*
- Implemented **C++ APIs** and V8 Bindings in the core PDF library to support JavaScript AcroForms and **asynchronous** APIs on PDF clients
- Designed a low-level, compile time constant C++ permission handling structure which reduced permission check latency by **3%**
- Developed a **Testing Framework** using Timer Trees and performed **code reviews** with **Microsoft Edge** team for its **deployment**
  Tech Stack: C++17, V8 JavaScript Engine, GN

Verification in Learning from Demonstration — *University of Texas at Austin*
Research Assistant (Prof. Isil Dillig and Prof. Joydeep Biswas) — *Aug. 2022 - PRESENT*
- Exploring methods to guarantee safety and liveness specifications for **Action Selection policies** synthesized for Robots in the **Learning from Demonstration** domain with **limited** demonstrations using a Model Checker in a Counter Example Guided Approach
  Tech Stack: NuSMV, PySMT, Python

Aarogya Setu, India's Official COVID-19 Contact Tracing App — *Remote*
Software Enginering Intern — *Apr. 2020 - May. 2020*
- Sketched an **Asynchronous Client Server** model for an **MCMC** based contact tracing algorithm to accommodate mobile devices over unreliable connections, and a Proof-of-Concept to integrate Homomorphic Encryption for **privacy-preserving contact tracing**
- The tracing model outperformed the national testing efficiency by **2.8** times and helped trace **13 Million** potential COVID-19 victims
  Tech Stack: PyMC3, Python and asyncio, C++ and Microsoft SEAL

Adobe - Big Data Research Labs (Insight Recommendation) — *Bangalore (Remote)*
Research Intern — *May. 2020 - Jul. 2020*
- Scripted automated pipelines to discover insights from raw data using EDA methods, and implemented **Deep RL Models** and **Hybrid Linear Bandits** for their **personalized ranking**, using **submodularity** to improve $\alpha-$nDCG diversity metric by **8%** across categories.
- Implemented **Hierarchical Attention Network** and **Transformers** to detect Leading Indicators insight, tuning them to track **SnP** index
  Tech Stack: PyTorch, Dask, streamlit, Ray (distributed framework)

Select Projects

Low Level CUDA Programming for Neural Networks — *High Performance Computing*
Course Project, IIT Bombay — *Feb - Apr 2021*
- Implemented linear, convolutional neural network layers and activation functions in CUDA to explore block and batch parallelization opportunities and ideas for efficient computation of tensor products by contracting Einstein summations

Deepfake Face Detection — *AI & ML*
Course Project, IIT Bombay — *Oct-Nov 2019*
- Implemented **Transfer Learning** on **Xception** Net to detect DeepFake face images from real ones and explored architecture variations and **Ensemble learning**, visualizing feature maps and created benchmarks by parsing **DeepFake** Video datasets and Kaggle datasets

Acoustic Scene Classification — *Automatic Speech Recognition*
Course Project, IIT Bombay — *Oct-Nov 2019*
- Implemented **multi-class classfication** of outdoor recordings (mel spectrogram) into coarse and fine classes by using **Transformers**
- Experimented with data augmentation techniques like **SpecAugment**, audio clipping and audio transforms to improve performance

Technical Skills

Programming	**Strong**: C/C++17, Python, Bash Scripting **Familiar**: Go, Java, Javascript, V8 Engine, SQL
Software	**Strong**: Git, Linux/UNIX **Familiar**: Docker, GN Build, Linux perf, Microsoft SEAL, Wireshark, NuSMV, PySMT
AI/ML Libraries	**Strong**: PyTorch, Numpy, Keras, Scikit-learn, Tensorflow **Familiar**: Dask, Huggingfaces, PyMC3, MATLAB, OpenFST

Publications

CONCUR 2021 **Scope-Bounded Reachability in Valence Systems**, Aneesh Shetty, Krishna S., Georg Zetzsche
- Generalized the notion of context switches and scope bound for Valence Systems (generalize storage like multipushdowns) and showed **decidable state reachability** in PSPACE in scope bound, independent of storage structure