

Fenil Denish Bardoliya

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Education

MS Computer Science *Arizona State University* Aug 2023 - Present

Courses: Digital Video Processing, Nature Language Processing, Planning and Learning Methods in AI, Biocomputing, Information Assurance and Security, Image Analytics & Informatics, Data Mining, Statistical Machine Learning, Frontier Topics in GenAI

B.E. Computer Science *Birla Institute of Technology and Science Pilani* Aug 2019 - Jul 2023

Courses: Probability and Statistics, Object Oriented Programming, Database Systems, Data Structures and Algorithms, Network Programming, Software Development for Portable Devices, Reinforcement Learning, Machine Learning, Image Processing, Computer Vision

Technical Skills

- **Programming Languages:** Python, Kotlin, Java, C++, C, SQL, JavaScript, HTML, CSS, XML
- **Databases:** Firebase Firestore, Firebase Realtime Database, MySQL, MongoDB
- **Libraries, Frameworks and Tools:** Scikit-learn, TensorFlow, Keras, PyTorch, HuggingFace, OpenCV, Albumentations, Pillow, Matplotlib, Numpy, Pandas, NLTK, Spacy, Networkx, REST API, Git, JUnit, Docker, GCP, Wireshark, AutoML
- **Concepts:** Deep Learning, Machine Learning, Large Language Models, Computer Vision, Generative AI, Image Processing, Software Development, Android App Development

Work Experience

Assistant Engineer *Samsung Semiconductor India Research* Jan 2023 - Jul 2023

- Built scripts to automate network module data capturing and static analysis. Proposed development of anomaly detection for first-level call logs.
- Developed a hybrid LSTM encoder-decoder architecture for anomaly detection of SIP and IMS failures over VoLTE networks.
- Attained nearly 80% accuracy in detecting 25 known and some unknown errors.

Teaching Assistant *Software Development for Portable Devices, BITS Pilani* Sept 2022 - Dec 2022

- Conducted 10 labs on Android Programming and App development.
- Designed 4 quizzes to assess more than 50 students. Restructured the course to Android Development in Kotlin.
- Reviewed over 10 project ideas and mentored over 50 students for group projects.

Android App Developer *Blyndr* May 2021 - Jul 2021

- Managed two teams to work on the UI design and database creation. Developed a blind dating app for the LGBTQIA+ community at a startup. Adopted MVVM architecture pattern, Firebase Realtime database, and Firebase Cloud Messaging.
- Published the Blyndr app on Google Play with 500+ downloads and users across 10 countries.

Projects

Exploring Unlearning in State Space Models Aug 2024 - Dec 2024

- Compared performance of Machine Unlearning techniques in State Space Models and Transformer-based models for privacy.
- Implemented Gradient Ascent (GA) and Gradient Ascent with Mismatch (GA + Mismatch) algorithms for unlearning for OPT-1.3B, Pythia-1.4B (Transformers), and Mamba-1.4B (SSM).
- Evaluated model performance using metrics: Perplexity, BLEU, ROUGE-L, and BLEURT across datasets (PKU-SafeRLHF, TruthfulQA).
- Delivered insights highlighting SSMs' resilience to catastrophic forgetting and slower adaptability to unlearning techniques compared to Transformer-based models.

Analyzing and Mitigating Hallucinations in MLLMs Aug 2023 - Dec 2023

- Evaluated the performance of Multimodal Large Language Models (InstructBLIP, LLaMA-Adapter-V2, LLaVA) on widely-used benchmark datasets: VQAv2 (real-world images) and CLEVR (synthetic images).
- Analyzed 6 different image augmentations (e.g., Gaussian Noise, Zoom Blur) and 4 reasoning-based language augmentations (e.g., conjunctions, disjunctions).
- Established a new benchmark for assessing the robustness and out-of-distribution behavior of MLLMs.
- Published findings in CVPR Workshop, EVGENFM2024. Paper title: "Evaluating Multimodal Large Language Models across Distribution Shifts and Augmentations".