

# Fenil Denish Bardoliya

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## Education

**MS Computer Science** *Arizona State University*

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*

2019-2023

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, Keras, REST API, Git, JUnit, Maven, Docker, GCP, Wireshark, AutoML
- **Concepts:** Deep Learning, Machine Learning, Large Language Models, Computer Vision, Generative AI, Image Processing, Software Development, Android App Development, Back-end

## 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

**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".

**Sign Language Translation**

Jan 2022 - May 2022

- Fine-tuned the pre-trained Inception v3 model on a custom dataset of 3000 images per alphabet to classify static sign language alphabets, achieving a 97.58% accuracy on the test set.
- Extended the approach to translate video sequences using transformer-based encoder-decoder architecture utilizing the PHOENIX14T dataset.
- Applied a hybrid loss function (CTC and cross-entropy loss) for enhanced gloss and translation accuracy. Achieved BLEU-4 score of 12.75 for video translation using a pre-trained T5-small model.