Nihar Shah

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Education

Degree	Institute	CPI/%	Year
B.Tech.	IIT Gandhinagar	8.59	2022 - Present
Class XII	Prakash College of Commerce and Science	87.17	2022
Class X	Ryan International school	97.6	2020

INTERNSHIP

- **Summer Internship, Corover.ai** **[May, 2024 - July, 2024]**
  (LLM,Real-time Face Recognition, Video Processing, Streamlit, WebRTC, Voice Cloning, Corover.ai)
  - Developed a real-time face recognition system using Python, OpenCV, and the face-recognition library, integrating deep learning for face encoding. Implemented secure registration, Aadhaar details retrieval for recognized faces, and managed data through CSV file storage and Tkinter GUI.
  - I am currently working under the CTO of Corover.ai and am leading a team of 3 interns in creating a user-friendly web interface using Streamlit and WebRTC for real-time video streaming and face recognition which can be used on zoom or google meet calls for authentication purposes specifically for interview like environments.
  - Developed a real-time text-to-speech system using Bark framework integrated with Torch and Coqui TTS. Implemented voice synthesis from text, utilizing deep learning techniques for efficient audio generation. Successfully loaded and utilized pretrained checkpoints for model evaluation and synthesized high-quality speech outputs saved as WAV files.

PROJECTS

- **Animal Classification Using Custom CNN Models :** **[Apr, 2024 - May, 2024]**
  (Advisor – Prof. Prof. Nipun Batra, IIT Gandhinagar) | *Project Link*
  - Developed and evaluated custom CNN models for animal classification across one-vs-rest, binary, and 5-class scenarios using a dataset of 90 animal images.
  - Organized dataset for multi-class classification, implemented custom CNN architecture without pre-existing models, and utilized 3-fold cross-validation for robust evaluation.
  - Achieved accurate classification results, visualized convolutional layer outputs to interpret learned features, and demonstrated effective model performance through classification matrices.

- **Text Generator based upon next character prediction from an MLP:** **[Feb, 2024 - March, 2024]**
  (Advisor – Prof. Prof. Nipun Batra, IIT Gandhinagar) | *Project Link*
  - This project involves generating text by predicting the next character based on the last 'k' characters. The model used is a neural network with an embedding layer followed by 2 hidden layers. The model is able to capture the semantics of English language and generate meaningful words and phrases.
  - Observed the difference in results based on the choice of embedding and architecture of the neural network. Performed hyperparameter tuning to get the best results. Learned to deploy an application on Streamlit.

- **Binary Image Classification Using VGG Architecture :** **[March, 2024 - Apr, 2024]**
  (Advisor – Prof. Prof. Nipun Batra, IIT Gandhinagar) | *Project Link*
  - Implemented VGG1 and VGG3 architectures for Convolutional Neural Networks and tested their performance on the classification of two image classes.
  - Performed Augmentation over the dataset and trained the VGG3 model over this augmented dataset.
  - Performed Transfer Learning over the pre-trained VGG16 models while both freezing and un-freezing the fully connected layers.
  - Compared the performance of all these models by the gradual increase in classification accuracy over the testing images, changes in training and validation losses using Tensorboard.

- **Modelling Oil spillage - Advection-Diffusion Equation(2-D)** **[April, 2023 - June, 2023]**
  (Advisor – Prof. Dilip Srinivas Sundaram and Prof. Akshaa Vatwani, IIT Gandhinagar) | *Project Link*
  - Conducted an in-depth analysis of the Convection-Diffusion Equation within the framework of mathematical modeling.
  - Applied theoretical constructs such as Reynold's Transport Theorem to various engineering domains, showcasing a comprehensive understanding.
  - Explored the intricate relationships between the Diffusion Equation, Brownian Motion, and derived numerical solutions.

- **Human Activity Recognizer (using Machine Learning) :** **[Jan, 2024 - Feb, 2024]**
  (Advisor – Prof. Prof. Nipun Batra, IIT Gandhinagar) | *Project Link*
  - Made a machine learning model that uses only decision trees to recognise 6 different human activities by utilizing time series data of acceleration involved

- Learned to handle time series data by employing featurization and dimension reduction. Performed hyperparameter tuning select the best model based on bias-variance tradeoff. Deployed the model and tested the predictions on real acceleration data from collected from a smartphone.

- **Child Safety App** **[Aug, 2023 - Sept, 2023]**
  (Advisor – Prof. Nithin.V.George, IIT Gandhinagar) | *Project Link*
  - Engineered a mobile app for real-time monitoring of a child's cycle using GPS, accelerometer, and gyroscope data.
  - Implemented features like over-speed detection, fall detection, and boundary crossing for enhanced safety.
  - Ensured secure communication and automatic audio recording for timely parent notifications.
  - Established secure communication via TCP/IP model over the IITGN-SSO network.
  - Implemented automatic audio recording on the child's device for unattended alarms, ensuring timely parent notification.

- **Smart Game Engine using C/C++** **[Aug, 2023 - Nov, 2023]**
  (Advisor – Prof. Balagopal Komarath, IIT Gandhinagar) | *Project Link*
  - Created a repository containing intelligent game implementations, wherein the computer utilizes optimal strategies to make moves for games like Connect4, UpitUp, Sudoko, TicTacToe,Sim. Mastered graph-based algorithms.

- **Data Narrative of Tennis Major Tournament :** **[March, 2023 - May, 2023]**
  (Advisor – Prof. Shanmuganathan Raman, IIT Gandhinagar) | *Project Link*
  - Observed the data of Tennis Major Tournament USA, and analyzed different predictions and trends.
  - Visualized data points, curves, graphs using NumPy, Matplotlib, Pandas, scikit-learn, and SciPy.

- **Evaporative Peltier Cooling Tent, for humidity and temperature regulation** **[May, 2023 - July, 2023]**
  (Advisor – Prof. Udit Bhatia, IIT Gandhinagar) | *Newspaper Article*
  - Engineered a smart sensor-based,collapsible temperature and humidity regulating device to assist individuals whoare more susceptible to heat strokes and need a cool environment while working in extreme temperature conditions.
  - Successfully incorporated the Peltier Module for cooling along with the traditional Evaporative based Cooling method to achieve an optimal balance between efficiency as well as sustainability of the cooling model.

TECHNICAL SKILLS

- **Languages:** Python, C, C++, C#, Verilog
- **Tools:** Xilinx Vivado, Android Studio, Git(Basic), TinkerCad, Latex, Unity, Autodesk Fusion360, MATLAB.
- **Libraries:** Streamlit, Tensorflow, Scikit-learn, Pytorch, Seaborn, Matplotlib, OpenCV, Numpy, Pandas, Matplotlib, Sci-Py, TSFEL.

RELEVANT COURSES

- **ML/DataScience :** Machine Learning (A- or 9/10), Data Centric Computing (A- or 9/10)
- **Signals and Systems :** Signals, Systems and Random Processes (A- or 9/10)
- **Math:** Numerical Methods (A or 10/10), Linear Algebra and Single Variable Calculus (A or 10/10), Ordinary Differential Equations (A or 10/10), Calculus of Several Variables(A- or 9/10)
- **DSA:** Intro to Computing(A- or 9/10), Data Structures and Algorithms 1 (83/100 and B or 8/10).
- **Others:** Digital Systems (A or 10/10), Principles and Applications of Electrical Engineering(A or 10/10)

POSITIONS OF RESPONSIBILITY

- **Senior Executive, Events and Events Management, Amalthea'23 :** **[Aug, 2023 - Oct, 2023]**
  - Served as the Event Lead for GameJam'23, a global-scale event that attracted participants from diverse locations including Malaysia, Italy, Indonesia, and more.
  - Organized a Game Development Workshop, attracting 500+ participants from top institutes, promoting game development culture.
  - Contributed to Events Management, ensuring smooth logistics, accommodations, and hospitality for a seamless experience.

- **Team Lead of Group of 30** **[May, 2023 - July, 2023]**
  - Led a diverse team of 30 individuals from various disciplines, optimizing their full potential through strategic work allocation and fostering a collaborative and healthy work environment.
  - Acquired hands-on experience in project planning, resource allocation, and problem resolution, contributing to a successful outcome in addressing heatstroke prevention.

ACHIEVEMENTS

- Achieved All India Rank of **3068** in JEE Advanced '22, among 1.1 million aspirants.
- Felicitated with Dean's List award in Semester 2 for excellent academic performance, IITGN.