Venkatesh Desai

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EDUCATION

Northeastern University, Boston, MA - **Khoury College of Computer Science** Expected Apr 2024

Master of Science in Robotics - Computer Science concentration

- Relevant Coursework – Deep Learning, Reinforcement Learning, Adv. Perception, Algorithms, Natural Language Processing

Indian Institute of Information Technology, IND Sep 2021

Bachelor of Technology in Mechanical Engineering with Specialization in Design and Manufacturing

SKILLS

- **Languages:** Python, C, MATLAB, Linux, SQL, bash/ shell scripting, Git
- **Tools:** Pandas, NumPy, scikit-learn, Pytorch, Keras, TensorFlow, OpenCV, GitHub, Matplotlib, Spacy, NLTK, Hugging Face, ROS, Gazebo, PyBullet, Azure, AWS, GCP, Docker, ZenML, MLflow
- **Modeling Techniques**: Object Detection, Segmentation (Semantic, Instance), Pose-Estimation, VAE, GANs, Diffusion models, 3D Reconstruction, NeRF, Few-shot learning, Multimodal Learning (Transformer-based architectures), Explainable AI

EXPERIENCE

Research Assistant and Graduate Teaching Assistant | Northeastern University Aug 2023 – Present

- Collaborating on enhancing **nnsight** library, a package for interpreting and manipulating the internals of a neural network
- Developing tutorials with **GPT2, Llama** models for users to seamlessly use nnsight library in conducting experiments
- Graduate Teaching Assistant – Assisted a **Deep Learning** course (CS7150), focusing on **Neural Network, Transformers, VAE's, Stable Diffusion**. Designed assignments, conducted TA sessions, organized Quiz and led discussions on cutting-edge research areas such as **GAN's, Image Transformer, and LLM** to help students stay up-to-date of the latest advancements

Co-Founder | iTorque May 2021 – July 2022

- Designed 20% efficient hydrodynamic gear sets to replace traditional gear sets currently used in the market
- Utilized **k-means clustering** algorithms to segment customer base, this helped us to understand the product market fit

(Key Learnings - Team Collaboration, Communication skills, Business performance, User experience, Lean Startup methodology)

ML Intern | Air India Nov 2019 – Jan 2020

- Reduced **restocking lead times by 15%,** optimizing real-time airline supply chain decisions using a **Random Forest** model
- Achieved a **90% accuracy rate** in classifying user intents, including booking flights, checking flight status, and general inquiry
- Implemented data-driven techniques such as **A/B testing,** resulted in a **20% improvement** in user interface significantly

PROJECTS

Detect AI Generated Text Jan 2024 – Apr 2024

- Integrated augmented essays generated using techniques like spelling correction, character deletion, back translation
- Fine-tuned DistilBERT and Mistal 7B models achieved a **ROC-AUC score of 0.88 and 0.93** to detect AI generated content

Ball Catching Robotic Arm Jan 2024 – Apr 2024

- Utilized **YOLO-v8** model to segment a ball and determine its 3D location through a monocular camera for trajectory prediction
- Tuned control gain values of **ReactorX-200 arm** for swift positioning, motion planning and catching the ball mid-air

Shadow Removal using Shadow Decomposition Aug 2023 – Dec 2023

- Employed a deep learning to remove shadows from images by using the physical principles of shadow formation.
- Decomposed shadow image using U-Net and VGG architectures to achieve 40% reduction in RMSE for shadow areas of image

Super Resolution using Cascading Residual Network (CRN) Architecture Aug 2023 – Dec 2023

- Employed an efficient and lightweight model that utilized a cascading mechanism for effective information transfer
- Achieved state-of-the-art performance on standard datasets like Set5 and Urban100 with an improvement of 0.2dB in PSNR

Self-Driving Car May 2020 – Dec 2020

- Developed an autonomous vehicle utilizing a Convolutional Neural Network (CNN) (**NVIDIA End-to-End** architecture) and IoT
- Trained the neural network model on **17,500 diverse images**, achieving **90% accuracy** in the steering angle predictive model

EXTRA-CURRICULAR ACTIVITIES

- Lead team to **Top 5** position among 180 Teams from INDIA, in **NASA International Space Apps Challenge 2020**
- **Utility Patent: A Method and a System for Autonomous Training and Assessing the Gym Users** (App. # - 202141049354)