AMOL KERKAR

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WORK EXPERIENCE

Larsen and Toubro Technology Services, *Automation Engineer* **| Navi Mumbai, India** **Sep 2022 - Aug 2023**

Skills: Deep learning, ECU-Test, Object detection, SQL, Shell Script, Git, OpenCV

- Designed and deployed a defect detection system using **Faster R-CNN** on HMI images, achieving 91% accuracy and significantly improving efficiency in defect identification
- Revitalized menu screen coverage for defect findings by identifying anomalies and enhancing UI accuracy through the strategic implementation of **Keras-OCR** and **Advanced Image Processing** techniques
- Engineered an **Autoencoder-CNN** model for automated language-based defect identification in menu screens
- **Developed an application** with various connection modes to BMW racks, featuring diverse functionalities, including capturing instrument cluster images, infotainment display images, and videos
- Won the **Spot Award** for being a key member for development of Automation and implementation of utilities in LTTS

Larsen and Toubro Technology Services, *Associate Engineer* **| Navi Mumbai, India** **Oct 2021 - Sep 2022**

Skills: Neural networks, Computer Vision, Scikit-Learn, Image processing, ECU-Test, Some/IP, Android debug bridge

- Developed services packages for **XML-parsing**, and **Python script**s for automating the entire test environment in the **ECU-Test** for the Human-Machine Interface domain
- Automated and developed **Some/IP scripts** for communicating with the BMW test rack's Media Graphical Unit (MGU) to imitate real-time car environment
- Proposed an innovative concept to the client: **Excel-driven automation** for navigation in Android infotainment, utilizing a **proprietary library** built with **Appium**
- Designed a utility encompassing various image comparison applications for LINUX-based infotainment systems using Python's **machine learning** and **computer vision** libraries

RESEARCH EXPERIENCE

State University of New York at Binghamton, *Research Assistant* **Feb 2024 - Present**

Skills: Contrastive learning, Human-Computer Interaction, CycleGANs, Signal processing, PyTorch

- Currently engaged in research under the guidance of Dr. Yincheng Jin, focusing on the application of Generative Adversarial Networks (GANs) in signal processing for enhancing Human-Computer Interaction (HCI)
- This project aims to develop innovative methods to improve interaction systems by leveraging the capabilities of GANs in processing and interpreting complex sensor signals

EDUCATION

State University of New York, Binghamton, NY **Expected May 2025**

Master of Science in Computer Science - Artificial Intelligence Track

Courses: Machine Learning, Advanced ML, Natural Language Processing, High Performance Computing, Human Computer Interaction, Design and Analysis of Algorithms, Programming Languages

K.J. Somaiya College of Engineering, Mumbai, India **Aug 2017 - May 2021**

Bachelor of Technology in Electronics Engineering

Courses: Digital Signal Processing, Image Processing, Introduction to Robotics

TECHNICAL SKILLS

Programming Languages: Python, C, C++, SQL, Haskell
Libraries/Frameworks: TensorFlow, Scipy, Numpy, Pandas, NLTK, Keras, OpenCV, PyTorch, Matplotlib, Flask, Hadoop
Web Technologies: HTML, CSS, JavaScript, React, TypeScript
Tools/Databases: Git, JIRA, Confluence, AWS, Docker, Jupyter Notebook, MySQL, MongoDB, Anaconda, Redis
Certifications: Machine Learning (Stanford Online), Tensorflow Developer (DeepLearning.ai), Introduction to IOT and Embedded Systems (UCI), Sequences, Time series and prediction, Convolutional Neural Network, Natural Language Processing (Coursera)

ACADEMIC PROJECTS

Music Genre Detection | *TensorFlow, Keras, Librosa, Convolutional Neural Networks (CNN)*

- Developed a machine learning model for **audio genre classification** using a Convolutional Neural Network (CNN) trained on the GTZAN dataset, achieving accuracy of **89.8%** across various music genres
- Implemented a **user-friendly GUI** application that allows users to interact with the trained model, making genre predictions by playing audio files

Smart Snake | *Reinforcement learning, PyGame, Deep learning*

- Developed a **reinforcement learning agent** for playing the classic Snake game autonomously and visualized the agent's learning progress using provided plotting functions, allowing for insight into its improvement over time
- Trained the agent using **Q-learning algorithm**, enabling it to learn optimal strategies for gameplay
- Conducted iterative training sessions to optimize the agent's performance, adjusting hyperparameters as needed

Spam SMS detection using BERT | *Transfer Learning, Natural Language Processing, Transformers, Flask, HTML, CSS*

- Developed an SMS classification model using BERT-based **transfer learning** to distinguish between spam and non-spam messages with **94%** accuracy and employed techniques to handle imbalanced classes, ensuring robust performance
- Successfully **deployed** the model using **Flask**, creating a real-time, user-friendly and interactive web interface

Facial emotion recognition | *OpenCV, Dense Neural Networks, Data Visualisation*

- Implemented a real-time **emotion recognition** system using a webcam utilizing **Convolutional Neural Networks** (CNN) and transfer learning with **DenseNet169** and **DenseNet201** architectures with a ROC-AUC score of **91.97%**
- Optimized model performance through **hyperparameter tuning**, including learning rate adjustments and L2 regularization

EXTRA CURRICULUM AND INVOLVEMENT

- **Won** Intra college **hackathon** by building the model of a "Smart medicine reminder and vending machine" from scratch in 36 hours under the category of **student innovation**
- **Top 22** among all the employees across the global offices of LTTS in TechExpression™ - An **innovation challenge**
- Working as a **Student Security Assistant** with the New York State University Police Department