GAURAV GAONKAR

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EDUCATION

Brown University, Rhode Island **August 2023**
Master in Computer Science (*Expected Graduation: May 2025*)
Vidyalankar Institute of Technology, University of Mumbai **August 2019 – May 2023**
Bachelor of Engineering in Computer Engineering, GPA - **9.72**

RESEARCH EXPERIENCE

Research Assistant | Carney Institute for Brain Science, Brown University **September 2023 - Present**
- Working on research alongside Dr. Thomas Serre and Drew Linsley, focusing on neural computations for harmonizing current Deep learning architectures with underlying visual perception.

Undergraduate Research Intern | Vidyalankar Institute of Technology **December 2021 - October 2022**
- Led Machine Learning and Signal processing implementation, focused on classifying fetal health using audio-based data from electronic stethoscopes.
- Implemented signal processing techniques, including Recurrent Quantification Analysis and Spectral Analysis on audio data, that performed with a test accuracy of 93% with a Decision Tree Classifier.
- Contributed to the research documentation for patenting our novel FHR classification solution under the Indian Patent Office.

Computer Vision Intern | Raga AI **January 2022 - April 2022**
- Developed a Dual Adversarial GAN for detecting data drift and highlighting the need for tuning DNN classifier parameters.
- Developed a Root Cause Analysis software, improving the IOU metrics by up to 7% for object detection models.

Research Engineer Intern | Ola Electric Mobility Pvt. Ltd. **July 2021 - December 2021**
- Developed a classical computer vision-based approach for vehicle tire damage detection, with an overall test accuracy of 72%.
- Contributed to categorizing defects (classes), collecting data, and designing an analytical approach with very limited samples.
- Implemented texture-based local and global descriptors like Gauss Markov Random Field, Gray Gradient Co-occurrence Matrix, Laws Feature, and Tamura for extracting useful input features.
- Performed root cause analysis to understand the model's shortcomings and improved the performance by up to 5%.

PATENT AND PUBLICATIONS

- Paper “Swift Medical Report Analysis using Computer Vision (SMRA-CV)” published in the International Research Journal of Engineering and Technology (IRJET) **[1]**
- Paper “Gradient Boosting Approach for Traffic Flow Prediction using CatBoost” published in the IEEE International Conference on Advances in Computing, Communication, and Control [2].
- Paper “Education in AI Era: A Novel Approach to Enhance Learning and Development” published in the International Journal of Science Engineering and Technology (IJSET) [3]
- Paper “Scientific Paper Recommendation” published in IEEE International Conference for Convergence in Technology (I2CT) [4]
- Paper “Concept-Citation Directed Graph Based Scientific Paper Recommendation - CCSPR” *(under review)*
- Patent “A Hybrid Method for Fetal Heart Rate Classification,” - *(published)* Indian patent Application No. 20221064091 - Date of Publication: November 18, 2022.

PROJECTS

Scientific Paper Recommendation, Vidyalankar Institute of Technology **August 2022 - January 2023**
- Led a team of four on a project to create a graph-based end-to-end advanced scientific paper recommendation engine.
- Designed and trained a GraphSage Neural Network-based architecture for the node-link prediction on our novel Concept-Citation Directed Graph comprising 20k research papers.
- Utilized Transformer model embeddings in the graph network for more contextual information.
- The new graph model improved accuracy by ~30% compared to our existing system [3] and performed with a test accuracy of 86%.

Traffic flow prediction, Vidyalankar Institute of Technology **August 2021 - October 2021**
- Led a team of four on a project to create an end-to-end traffic flow prediction application for reducing traffic congestion within a designated area.
- Identified critical structural properties of the roads responsible for traffic congestion. Resulting in an improved model performance by up to 14%.

COURSES

Graduate: Introduction to Robotics, Computational Probability and Statistics; **Undergraduate**: Deep learning, Machine Vision, Machine learning, Artificial Intelligence, Probabilistic Graphical Models, Distributed Systems, Linear Algebra

MOOC: NPTEL Reinforcement Learning (IIT Madras), Coursera Reinforcement Learning Specialization (University of Alberta),

TECHNICAL SKILLS

Language: Python, C; **Database**: MySQL, PostgreSQL; **Backend**: Flask, Django; **Machine Learning Libraries**: Sklearn, Matlab; **Deep Learning Framework**: Pytorch, Tensorflow; **Operating system**: Linux, Windows; **Reinforcement Learning**: OpenAI gym.