

Shyamal Dharia

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EDUCATION

The University of Winnipeg

Master of Science, Applied Computer Science

- GPA: 4.43 / 4.5

Winnipeg, Canada

Sept 2022 – Present

Gujarat Technological University

Bachelor of Engineering, Electronics & Communication Engineering

- GPA: 7.97 / 10

Gujarat, India

2017 – 2021

WORK EXPERIENCE

The University of Winnipeg

Research Assistant

- Designed and executed customized EEG experiments to collect data on emotion regulation failures, effectively integrating and synchronizing the experiments with portable EEG devices for seamless data acquisition.
- Integrated a photodiode sensor on a portable EEG device, enabling precise synchronization with visual stimuli presentation.
- Developed a multimodal deep learning architecture for subject-independent EEG-Based emotion recognition. Achieved 72% accuracy in classifying 5 distinct emotions.

Winnipeg, Canada

Sept 2022 - Present

TIATECH

Electronics & Computer Vision Intern

- Developed a deep learning architecture for textile fabric fault detection, implementing transfer learning from VGG16.
- Optimized the data pipeline to standardize images into 224x224 pixel values and applied data augmentation techniques in the training dataset, resulting in enhanced fault detection accuracy (94%) while preventing overfitting.
- Developed motion planning and control software for a 6-axis robotic arm utilizing tools such as MoveIt and ROS.

Surat, Gujarat

Jan 2021 – Nov 2021

EXPERIMENTAL PROJECTS

ViT (Vision Transformer) for Emotion Recognition

Sept 2023 - Present

- Transformed EEG features into images (28x28x3), implemented patching and linear mapping to divide input images into equal-sized sub-images and map them into a linear space.
- Integrated positional encoding to enable the model to identify the original location of each patch in the image.
- Utilized transformer encoders with multi-head self-attention mechanisms and implemented a classification MLP block for the final classification.
- Currently, working on improving the performance (~50% accuracy) of the model.

Eye-Tracking Algorithm

July 2023 - Present

- Developed an eye-tracking algorithm that allows researchers to extract eye movement features when collecting EEG data for behavioral sciences experiments.
- Utilized OpenCV to detect the pupil and accurately segment it for tracking and measuring pupil dilation in indoor light settings.
- Future implementation includes detecting the number of blinks in parallel with pupil dilation, with a focus on integrating the algorithm on Raspberry Pi Zero or 4.

Human Activity Detection

July 2022 – Aug 2022

- Developed a Real-Time walking and mopping activity detector, utilized short videos of people mopping and walking for data collection of the Deep Learning model. Utilized mediapipe framework for pose & face landmarks detection and extracted those landmarks for training a deep learning model.
- Built and trained the model using LSTM architecture with achieved 97% accuracy.

TECHNICAL SKILLS

Machine Learning: PyTorch, TensorFlow, Keras, Scikit-Learn, Numpy, SciPy, and Pandas.

Programming Languages: C++, Python, JavaScript, HTML and CSS

Version Control: Git and Github

LEADERSHIP EXPERIENCE

Blood Donation Campaign

Jan 2019

Student core co-ordinator

- Organized facilities for an event to take place at the seminar hall of Shree Swami Atmanand Saraswati Institute of Technology.
- Registered over 300 participants for blood donation. Also donated blood with my fellow coordinators for the good cause.

Training & Placement Cell

2020-2021

Student core co-ordinator

- Selected in Training & Placement Cell of SSASIT, I was a student male representative of Electronics & Communication Engineering.

Project Fair 2021

April 2021

Project Lead

- Scheduled the timeline for completion of the project. Also, guided my teammates to gather information from several research papers on Face-Recognition system.
- Calculated the total cost of project and managed to reduce the total cost by 10%.
- Secured 3rd position in E&C project fair-2021 and our team won the best project award.

PUBLICATION

- S. Y. Dharia, C. E. Valderrama and S. G. Camorlinga, "[Multimodal Deep Learning Model for Subject-Independent EEG-based Emotion Recognition](#)," 2023 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Regina, SK, Canada, 2023, pp. 105-110, doi: 10.1109/CCECE58730.2023.10289007.