Shyamal Dharia

[GitHub] [Google Scholar] [LinkedIn] [Email] [Academic Website]

EDUCATION

University of Winnipeg — Winnipeg, Canada
Masters in Applied Computer Science — 2022 – 2024

- *GPA: 4.4/4.5—Graduated with Highest Distinction*

Gujarat Technological University — Surat, India
Bachelor of Engineering in Electronics & Communication — 2017 – 2021

- *GPA: 7.9/10*

PUBLICATIONS

Journal Publications:

1. **S. Y. Dharia;** Q. Liu; S. D. Smith; C. E. Valderrama
   A Novel Approach for the Early Identification of Genetic Risk Factors for Alzheimer's Disease Using EEG and Psychometric Data
   IEEE Journal of Biomedical and Health Informatics (JBHI), 2025
   https://doi.org/10.1109/JBHI.2025.3639217

2. **S. Y. Dharia;** C. E. Valderrama; Q. Liu; B. K. Fredborg; A. S. Desroches; S. D. Smith
   Fractal Dimension of Resting-State EEG as a Biomarker for Autonomous Sensory Meridian Response (ASMR)
   IEEE Journal of Biomedical and Health Informatics (JBHI), 2025
   https://doi.org/10.1109/JBHI.2025.3612301

3. **S. Y. Dharia;** Q. Liu; S. D. Smith; C. E. Valderrama
   Dual-Transformer Cross-Attention Framework for Alzheimer's Disease Detection via dPTE-Guided EEG Channel Selection and Multi-Modal Integration
   Biomedical Signal Processing and Control, 2025
   https://doi.org/10.1016/j.bspc.2025.108390

4. M. Niaki; **S. Y. Dharia;** Y. Chen; C. E. Valderrama
   Bipartite Graph Adversarial Network for Subject-Independent Emotion Recognition
   IEEE Journal of Biomedical and Health Informatics (JBHI), 2025
   https://doi.org/10.1109/JBHI.2025.3570187

Conference Publications:

5. M. Hojjati; **S. Y. Dharia;** S. G. Camorlinga; S. D. Smith; A. S. Desroches; B. D. Brenneman
   Using Machine Learning to Model EEG-Derived Brain Activity During Emotion Regulation
   Proceedings of the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Copenhagen, Denmark, 2024
   https://doi.org/10.1109/EMBC58623.2025.11253722

6. **S. Y. Dharia;** M. Hojjati; S. Rahman; M. M. T. Nur; C. E. Valderrama
   CNN-Based Chagas Disease Detection with 12-lead ECG
   Computing in Cardiology Conference (CinC) 2025 — PhysioNet Challenge
   [Link]

7. **S. Y. Dharia;** S. G. Camorlinga; C. E. Valderrama; M. Hojjati
   Dataset-Independent EEG Channel Selection for Emotion Recognition
   Proceedings of the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, USA, 2024
   https://doi.org/10.1109/EMBC53108.2024.10782444

8. **S. Y. Dharia;** M. Hojjati; S. G. Camorlinga; S. D. Smith; A. S. Desroches
   Leveraging Machine Learning and Threshold-Free Cluster Enhancement to Unravel Perception of Emotion and Implied Movement
   IEEE EMBS International Conference on Biomedical and Health Informatics (BHI), Houston, TX, USA, 2024
   https://doi.org/10.1109/BHI62660.2024.10913664

9. **S. Y. Dharia;** C. E. Valderrama; S. G. Camorlinga
Multimodal Deep Learning Model for Subject-Independent EEG-Based Emotion Recognition
IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), Regina, SK, Canada, 2023
https://doi.org/10.1109/CCECE58730.2023.10289007

Research Experience

University of Winnipeg Winnipeg, Canada
Senior Research Assistant 2025 – Present

- Conduct machine learning and statistical analysis on multimodal neuroimaging data (EEG, fMRI, sMRI) to study biomarkers of Alzheimer's Disease, ASMR, and other neurological conditions.
- Published two peer-reviewed papers in leading journals/conferences, contributing to the fields of biomedical signal processing and computational neuroscience.

Misericordia Health Center Winnipeg, Canada
Mitacs Accelerate Intern May 2024 – Dec 2024

- Developed an EEG data collection pipeline using PsychoPy with custom experiment integration, enabling two successful EEG-based emotion regulation studies with 60+ participants using wireless OpenBCI devices.
- Designed and trained machine learning models for emotion recognition and intensity prediction, leading to two conference publications.

Technical Skills

Programming Languages: Python (PyTorch, scikit-learn, NumPy, pandas) and C++ (CUDA)
Signal Processing & Neuroimaging: MNE-Python, Nilearn, SciPy, fMRIPrep
Software & Development: Linux/Windows, Git, Docker, ROS (Robot Operating System)

Awards

- 2025 - Graduate Student of Highest Distinction
- 2024 - EMBC NextGen Scholar

Leadership Experience

University of Winnipeg Winnipeg, Canada
CinC Physionet 2025 *2025*

- Led a team in the PhysioNet/Computing in Cardiology Challenge on Chagas disease detection from ECG signals with a CNN-based morphological features and lead-wise learning approach.

Teaching Assistant & Academic Services

- **Reviewer**—IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 26)
- **Reviewer**—IEEE EMBS International Conference on Biomedical and Health Informatics (BHI 25)
- **TA**—GACS-7203 Pattern Recognition (Fall 2024 and 2023—*Dr. Camilo E. Valderrama*)
- **TA**—GACS-7206 Advance Machine Learning (Winter 2024—*Dr. Sheela Rammana*)

Grant Writing Experience

- **Mitacs Accelerate (2023)**—Assisted in drafting the initial proposal in collaboration with PIs for successful research–industry grant worth $60,000.
- **NSERC Alliance (2025)**—Contributed to the early-stage drafting of a collaborative grant proposal with research faculty and industry partners worth $30,000, currently under review.
- **UWinnipeg Major Research Grant (2025)**—Assisted in preparing the initial proposal with the PI at the University of Winnipeg to support the direct costs of research (worth $7,500); currently under review.