Gnana Praveen R

Curriculum Vitae

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Summary

Experienced AI researcher specializing in computer vision, multimodal learning, and affective computing. Focused on dynamic expression recognition, audio-visual learning, and video analytics. Proven ability to develop cutting-edge models and translate research into impactful real-world applications.

Education

2018–2023 **PhD**, *Ecole de Technologie Superieure (**ETS**)*, Montreal, Canada.
Department of Systems Engineering
Laboratory for Imagery Vision and Artificial Intelligence (LIVIA)
Thesis: Deep learning-based Regression models for Dynamic Expression Recognition in videos
Advisors: Prof. Eric Granger and Prof. Patrick Cardinal

2010–2012 **Masters of Technology**, *Indian Institute of Technology Guwahati (**IITG**)*, India.
Electronics and Electrical Engineering
Image Processing and Computer Vision Laboratory
Master Thesis: A Code and Domain-Independent Traitor Tracing System
Advisor: Prof. Kannan Karthik

2005–2009 **Bachelor of Technology**, *Jawaharlal Nehru Technological University (**JNTU**)*, Kakinada, India.
Specialization: Electronics and Communication Engineering
Undergraduate Thesis: Image Inpainting using Exemplar-Based Synthesis

Research Interests

I am interested in the area of Machine Learning and Computer Vision including

- Multimodal Learning
- Deep Learning
- Affective Computing
- Video Analytics

Work Experience

Mar '23 - Present **Computer Research Institute Montreal, Canada**.
Post-Doctoral Researcher
Audio-Visual Learning
- Developed novel attention models for robust audio-visual feature extraction and fusion.
- Currently working on parameter-efficient audio-visual learners using Vision Transformers.

Jul '17 - Jan ' 18 **Synechron, Bangalore, India**.

Lead Engineer

Automated Document Classification
- Developed a system for the automatic classification of financial documents.

Iris Recognition
- Proposed an algorithm for Iris Recognition using low-resolution Visible Images.

Jul '15-Jun '17 **Impartus Innovation, Bangalore, India**.

Digital Signal Processing Engineer

Facial Analysis
- Developed a system for automatic face recognition of professors in classrooms.
- Developed a system for face tracking for the application of PIP in lecture videos.

Natural Language Processing
- Developed a system for automatic tagging of queries and similarity query matching.

Automatic Speech Recognition
- Developed a system of automatic speech recognition for lecture videos using kaldi.

Feb '14-Jun '15 **Samsung Research Institute, Bangalore, India**.

Senior Software Engineer

NIR Imaging
- Proposed an algorithm for the enhancement of images captured at low light scenarios.
- Proposed an algorithm for realistic skin smoothing for Portrait Enhancement.

Jul '13-Dec '13 **Supercomputer Education Research Center, Indian Institute of Science, Bangalore, India**.

Project Associate with Prof. R. Venkatesh Babu

Crowd Flow Analysis in H.264 Compressed Videos *Sponsered by DRDO*
- Proposed an algorithm for crowd flow segmentation by clustering the motion vectors in H.264 compressed domain using the Expectation-Maximization (EM) algorithm.
- Superpixel-based crowd flow segmentation is proposed using only the motion vectors in H.264 compressed videos, devoid of prior knowledge of flow segments.

Automatic Validation of Cheques *Sponsered by Tech Mahindra*
- Developed a general framework for the extraction of salient regions in the cheque for validating the presence or absence of required items based on SIFT features.

Jul'12-May'13 **Electronics and Electrical Engineering, Indian Institute of Technology, Guwahati, India**.

Associate Project Engineer with Prof. Roy P Paily

Feasibility Studies of Blind Navigation Assistance System *Sponsered by Deity*
- Developed a depth estimation technique from a single image based on a local depth hypothesis devoid of any user intervention and its application to assist visually impaired people.

Selected Publications (Google Scholar : 0.3k+ citations with h-index of 11)

2024 Less is Enough: Adapting Pre-trained Vision Transformers for Audio-Visual Speaker Verification .

R Gnana Praveen, and Jahangir Alam

4th ENLSP Workshop at Neural Information Processing Systems (**NeurIPS-W**) , 2024.

Incongruity-Aware Cross-Modal Attention for Audio-Visual Fusion in Dimensional Emotion Recognition .
R Gnana Praveen, and Jahangir Alam
IEEE Journal of Selected Topics in Signal Processing (**JSTSP**) **[Impact Factor:8.7]**, 2024. paper

Recursive Joint Cross-Modal Attention for Multimodal Fusion in Dimensional Emotion Recognition **(Achieved second place in valence-arousal challenge)**.
R Gnana Praveen, and Jahangir Alam
6th ABAW Workshop at Computer Vision and Pattern Recognition (**CVPR-W**), 2024. paper

Cross-Attention is Not Always Needed: Dynamic Cross-Attention for Audio-Visual Dimensional Emotion Recognition **Acceptance (Oral) Rate: 5.52%** .
R Gnana Praveen, and Jahangir Alam
IEEE International Conference on Multimedia and Expo (**ICME**), 2024. paper

Audio-Visual Person Verification based on Recursive Fusion of Joint Cross-Attention **Acceptance Rate: 39.4% Selected as one of the best reviewed-papers** .
R Gnana Praveen, and Jahangir Alam
3rd ENLSP Workshop at Neural Information Processing Systems (**NeurIPS-W**) , 2023. paper
IEEE International Conference on Face and Gesture Recognition (**FG**), 2024. paper

Dynamic Cross Attention for Audio-Visual Person Verification **Acceptance Rate: 39.4%** .
R Gnana Praveen, and Jahangir Alam
IEEE International Conference on Face and Gesture Recognition (**FG**), 2024. paper

2023 Recursive Joint Attention for Audio-Visual Fusion in Regression-based Emotion Recognition **(Oral)**.
R Gnana Praveen, Eric Granger and Patrick Cardinal
IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**), 2023. paper

2022 Audio-Visual Fusion for Emotion Recognition in Valence-Arousal Space Using Joint Cross-Attention **(Best of FG2021 : 6.33% of accepted papers in FG2021).** .
R Gnana Praveen, Patrick Cardinal, and Eric Granger
IEEE Transactions on Biometrics, Behavior, and Identity Science (**T-BIOM**) 2022. paper

A Joint Cross-Attention Model for Audio-Visual Fusion in Dimensional Emotion Recognition**(Oral)**.
R Gnana Praveen, Wheidima Carneiro de Melo, Nasib Ullah, Haseeb Aslam, Osama Zeeshan, Theo Denorme, Marco Pedersoli, Alessandro Koerich, Simon Bacon, Patrick Cardinal, and Eric Granger
Computer Vision and Pattern Recognition Workshops (**CVPR-W**), 2022. paper

Cross Attentional Audio-Visual Fusion for Dimensional Emotion Recognition **Acceptance (oral) Rate: 9.6% Selected as one of the best reviewed-papers**.
R Gnana Praveen, Eric Granger and Patrick Cardinal
IEEE International Conference on Face and Gesture Recognition (**FG**), 2021. paper

2021 Holistic Guidance for Occluded Person Re-Identification **Acceptance (Oral) Rate: 3.3%**.
Madhu Kiran, **R Gnana Praveen**, Le Thanh Nguyen-Meidine, Soufiane Belharbi, Louis-Antoine Blais-Morin, Eric Granger
British Machine Vision Conference (**BMVC**), 2021. paper

Deep domain adaptation with ordinal regression for pain assessment using weakly-labeled videos.
R Gnana Praveen, Eric Granger and Patrick Cardinal
Image and Vision Computing journal (**IVC**) [Impact Factor: 4.7], 2021. paper

2020 Deep Weakly-Supervised Domain Adaptation for Pain Localization in Videos **Acceptance Rate: 44%**.
R Gnana Praveen, Eric Granger and Patrick Cardinal
IEEE International Conference on Face and Gesture Recognition (**FG**), 2020. paper

2014 Superpixel Based Crowd Flow Segmentation in H.264 Compressed Videos.
Sovan Biswas, **R Gnana Praveen** and R Venkatesh Babu
IEEE International Conference on Image Processing (**ICIP**), 2014. paper

Achievements

October 2024 **Best Poster award** at AI and Digital Health Symposium, Montreal, Canada.
March 2024 Featured research article in the **IEEE Biometrics Newsletter**.
March 2024 Runner-up, valence-arousal challenge, 6th **ABAW** competition, **CVPR2024**.
September 2018 **FRQNT research scholarship** for my Ph.D. program at ETS, Canada
September 2017 **Spot Award** for iris recognition using visible images at Synechron
March 2016 **Go Extra Mile** Award for automatic tagging of text queries at Impartus Innovation

Professional Service

Reviewer ECCV 2024, ICME 2024, ICASSP 2024, ICASSP 2025, ACM MM 2023, ACM MM 2024, IEEE TAFFC, WACV 2021, WACV 2024, WACV 2025

Technical Skills

Systems Windows, Linux, MacOS, High-Performance Computing (Slurm)
Programming C, Matlab, Python, PyTorch

Declaration

I, R Gnana Praveen do hereby declare that all the particulars given herein are true to the best of my knowledge.

GNANA PRAVEEN R