PRITAM SARKAR

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RESEARCH INTERESTS

Currently, I am a Ph.D. student at *Queen's University* and an Affiliate at *Vector Institute*. My primary research interests include self/un-supervised learning, computer vision, video understanding, multi-modal (i.e., vision-language, audio-visual) representation learning, and continual learning, among a few others. Recently, I have also acquired an interest towards responsible AI and out-of-distribution robustness. I am actively looking for internship opportunities in any of these areas.

EDUCATION

Doctor of Philosophy **May 2020 - Apr 2025 (expected)**
Dept. of Electrical and Computer Engineering, Queen's University *Kingston, Canada*
Advisor: Prof. Ali Etemad
GPA: 4.3/4.3

Master Applied Science **Sept 2018 - Apr 2020**
Dept. of Electrical and Computer Engineering, Queen's University *Kingston, Canada*
Thesis title: Self-Supervised ECG Representation Learning for Affective Computing.
Advisor: Prof. Ali Etemad
GPA: 3.8/4.3

Bachelor of Technology **Aug 2011 - Jul 2015**
Dept. of Electrical Engineering, West Bengal University of Technology *Kolkata, India*
Rank 4 of 150 in graduating class of the Department of Electrical Engineering.
GPA: 8.84/10

PUBLICATIONS

As per google scholar, my publications have total citations of approx. 260 with h-index 6.

Conferences

8. **P. Sarkar**, A. Etemad, "XKD: Cross-modal Knowledge Distillation with Domain Alignment for Video Representation Learning", *arxiv:2211.13929, 2022, Under Review* ***ICCV***.
7. **P. Sarkar**, A. Posen, A. Etemad, "AVCAffe: A Large Scale Audio-Visual Dataset of Cognitive Load and Affect for Remote Work", *arxiv:2205.06887, 2022,* ***AAAI****, 2023*.
6. **P. Sarkar**, A. Etemad, "Self-supervised Audio-Visual Representation Learning with Relaxed Cross-Modal Synchronicity", *arxiv:2111.05329 2021,* ***AAAI****, 2023*. Oral
5. **P. Sarkar**, A. Etemad,"CardioGAN: Attentive Generative Adversarial Network with Dual Discriminators for Synthesis of ECG from PPG", ***AAAI****, 2021*. Virtual
4. R. Phinnemore, G. Cimolino, **P. Sarkar**, A. Etemad, T.C. N. Graham, "Happy Driver: Investigating the Effect of Mood on Preferred Style of Driving in Self-Driving Cars". *HAI, 2021*.
3. **P. Sarkar**, A. Etemad, "Self-supervised Learning for ECG-based Emotion Recognition", ***ICASSP****, 2020*. Oral
2. **P. Sarkar**, K. Ross, A. Ruberto, D. Rodenburg, P. Hungler, A. Etemad, "Classification of Cognitive Load and Expertise for Adaptive Simulation using Deep Multitask Learning", *ACII, 2019*. Oral
1. **P. Sarkar**, V. Davoodnia, A. Etemad, "Computer-Aided Diagnosis using Class-Weighted Deep Neural Networks", *ICMLA, 2019*.

Journals

4. **P. Sarkar***, S. Lobmaier*, B. Fabre, G. Berg, A. Mueller, M. G. Frasch, M. C. Antonelli, A. Etemad, "Detection of Maternal and Fetal Stress from ECG with Self-supervised Representation Learning", ***Scientific Reports***, 2021.
3. **P. Sarkar**, A. Etemad, "Self-supervised ECG Representation Learning for Emotion Recognition", ***IEEE Transactions on Affective Computing***, *2020*.
2. A. Ruberto, D. Rodenburg, K. Ross, **P. Sarkar**, P. Hungler, A. Etemad, D. Howes, D. Clarke, J. McLellan, D. Wilson, A. Szulewski, "The future of simulation based medical education: Adaptive simulation utilizing a deep multitask neural network", *AEM Education and Training, 2021*.
1. K. Ross, **P. Sarkar**, D. Rodenburg, A. Ruberto, P. Hungler, D. Howes, A. Szulewski, A. Etemad, "Toward Dynamically Adaptive Simulation: Multimodal Classification of User Expertise using Wearable Devices", *Sensors, 2019*.

Patents

1. **P. Sarkar**, A. Etemad, "Method and Apparatus for Generating an Electrocardiogram from a Photoplethysmogram", *US Patent Application, Under Review*

EXPERIENCE

Research Assistant *at Queen's University, Canada* *Sept 2018 - Present*
My research is primarily focused on self-supervised learning, to learn meaningful representations without (or with minimal) human supervision. Please see my website/publications to find out more about my research.

Affiliate *at Vector Institute, Canada* *Mar 2021 - Present*

Machine Learning Research Intern *at Borealis AI, Canada* *Sept 2022 - Dec 2022*
We introduce AugESeq, the first data augmentation technique based on conditional diffusion mode for asynchronous event sequences.

Lecturer/Teaching Assistant *at Queen's University, Canada* *Sept 2018 - Present*
- Guest Lecturer for ELEC 872 (Artificial Intelligence and Interactive Systems), Fall 2022.
- Head Teaching Assistant for ELEC 472 (Artificial Intelligence) in winter 2023.
- Head Teaching Assistant for ELEC 472 (Artificial Intelligence) in winter 2022.
- Teaching Assistant for ELEC 472 (Artificial Intelligence) in winter 2021.
- Course Developer for ELEC 252 (Electronics I) in Fall 2020.
- Teaching Assistant for APSC 143 (Introduction to Computer Programming for Engineers) in Fall 2019.
- Course Developer for ELEC 472 (Artificial Intelligence and Interactive Systems) in summer 2019.

Sr. System Engineer *at Infosys Ltd., India* *Dec 2017 - Jul 2018*

Software Engineer *at Tech Mahindra Ltd., India* *Nov 2015 - Nov 2017*

ACADEMIC SERVICE

Mentorship
- Aaron Posen, ECE at Queen's University, undergrad final year project, 2021.
- Rachel Phinnemore, CS at Queen's University, undergrad final year project, 2020.

Reviewing/PC Member
- International Conference on Computer Vision (ICCV), 2023.
- Computer Vision and Pattern Recognition (CVPR), 2023.
- European Conference on Computer Vision (ECCV), 2022.
- IEEE Transactions on Affective Computing (T-AFFC), 2022 - Present.
- IEEE Transactions on Artificial Intelligence (T-AI), 2021 - Present.
- IEEE Affective Computing and Intelligent Interaction (ACII), 2021, 2022.
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2020.
- IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2019, 2020.
- ACM Symposium on Applied Perception (SAP), 2019.
- ECCV Workshop on Visual Object-oriented Learning meets Interaction (VOLI), 2022.

Organizing workshops and conferences
- Workflow and Publicity Chair AAAI 2023 Workshop on Representation Learning for Responsible Human-centric AI (R2HCAI).
- Workflow chair at AAAI 2022 Workshop on Human Centric Self-supervised Learning (HCSSL).
- Served in the organizing committee of AI/GI/CRV Conference, 2019.

Memberships/Others
- Student Rep. in Graduate Studies Academic Advisory (GSAC) Committee, Dept. of ECE, Queen's University, 2020 - 2021.
- PhD Rep. at Graduate Electrical and Computer Engineering (GECE) student council, Queen's University, 2020 - 2021.

ACADEMIC ACHIEVEMENTS/AWARDS

- Best Poster Honourable Mention at FEAS Research Symposium at Queen's University, 2022.
- Best Poster Honourable Mention at Robotics and AI Symposium at Ingenuity Labs, 2022.
- Best Poster Award at Robotics and AI Symposium at Ingenuity Labs, 2021.
- Postgraduate Affiliate Award, Vector Institute, 2021 - 2023.
- Graduate Research Fellowship, Queen's University, 2020 - Present.
- Graduate Research Scholarship, Queen's University, 2019 - 2020.

SKILLS

Deep Learning: PyTorch*, TensorFlow
Programming Languages: Python*, MATLAB, C, SQL, PL/SQL, HTML, CSS, UNIX
* indicates primary preference

CREATIVE INTERESTS

- Short-Film Making and Photography