# PRITAM SARKAR

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## RESEARCH INTERESTS

Currently, I am a Ph.D. student at *Queen's University* and Postgraduate Affiliate at *Vector Institute*. My primary research interests include self/un-supervised learning, computer vision, video understanding, and multi-modal (i.e., vision-language, audio-visual) representation learning. Additionally, I am interested in the areas of continual learning, generative models, and time-series representation learning among a few others. Recently, I have also grown interests in the areas of responsible AI including privacy, fairness, and security of deep learning models.

## EDUCATION

**Doctor of Philosophy** — **May 2020 - present**
*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. 230 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 CVPR*.
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*.
5. **P. Sarkar**, A. Etemad,"CardioGAN: Attentive Generative Adversarial Network with Dual Discriminators for Synthesis of ECG from PPG", ***AAAI***, *2021*.
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*.
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*.
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, "Title withheld", US Patent Application, 63/085,394, 2020.

## EXPERIENCE

***Machine Learning Research Intern*** *at Borealis AI, Canada* *Sept 2022 - Dec 2022*
My internship was focused on working with asynchronous time series data with Diffusion (generative) models.

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

***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**
- 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 - Present.
- 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