

# PRITAM SARKAR

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## RESEARCH INTERESTS

self/un-supervised learning, multi-modal (vision+x) representation learning, computer vision, wearable data analysis.

## EDUCATION

### Doctor of Philosophy

Dept. of Electrical and Computer Engineering, Queen's University  
Advisor: Prof. Ali Etemad  
GPA: 4.3/4.3

May 2020 - present

Kingston, Canada

### Master Applied Science

Dept. of Electrical and Computer Engineering, Queen's University  
Thesis title: Self-Supervised ECG Representation Learning for Affective Computing.  
Advisor: Prof. Ali Etemad  
GPA: 3.8/4.3

Sept 2018 - Apr 2020

Kingston, Canada

### Bachelor of Technology

Dept. of Electrical Engineering, West Bengal University of Technology  
Rank 4 of 150 in graduating class of Electrical Department.  
GPA: 8.84/10

Aug 2011 - Jul 2015

Kolkata, India

## PUBLICATIONS

As per [google scholar](https://scholar.google.com/citations?user=...), my publications have total citations of approx. 200 with h-index 6.

### Conferences

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, *Under Review*.
6. **P. Sarkar**, A. Etemad, "Self-supervised Audio-Visual Representation Learning with Relaxed Cross-Modal Synchronicity", *arxiv:2111.05329*, 2021, *Under Review*.
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**<sup>\*</sup>, S. Lobmaier<sup>\*</sup>, 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 - Present

**Postgraduate Affiliate** at Vector Institute, Canada

Mar 2021 - Present

**Research** at Queen's University, Canada

Aug 2018 - Present

I am a Research Assistant at *Ingenuity Lab* and *AIIM Lab* at Queen's University. My research is primarily focused on self-supervised learning, to learn meaningful representations without (or with minimal) human supervision. Please see my [website](http://www.pritamsarkar.com) to find out more about my research.

### **Teaching at Queen's University, Canada**

Aug 2018 - Present

- Guest Lecturer for ELEC 872 (Artificial Intelligence and Interactive Systems), Fall 2023.
- 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**

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### **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**

- ECCV Workshop on Visual Object-oriented Learning meets Interaction (VOLI), 2022.
- European Conference on Computer Vision (ECCV), 2022.
- IEEE Transaction of Artificial Intelligence, (T-AI), 2022 - Present.
- IEEE Affective Computing and Intelligent Interaction, (ACII), 2021, 2022.
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2020.
- ACM Symposium on Applied Perception (SAP), 2019.
- IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2019, 2020.

### **Organizing workshops and conferences**

- Workflow chair at AAAI 2022 Workshop on Human Centric Self-supervised Learning.
- 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.
- IEEE Graduate Student Member, 2020 - Present.
- Member of IEEE Signal Processing Society (IEEE SPS), 2020 - 2021.
- Member of Association for the Advancement of Affective Computing (AAAC), 2019 - 2021.

## **TALKS**

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- Poster presentation at Robotics and AI Symposium, Ingenuity Labs, 2021.
- Paper talk at AAAI, 2021.
- Paper talk at ICASSP, 2020.
- Poster presentation at FEAS Research Symposium, Queen's University, Canada, 2019.
- Paper talk at ACII, 2019.

## **ACADEMIC ACHIEVEMENTS/AWARDS**

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- Best poster award at Robotics and AI Symposium, (RAIS), 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**

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**Deep Learning:** PyTorch\*, TensorFlow

**Programming Languages:** Python\*, MATLAB, C, SQL, PL/SQL, HTML, CSS, UNIX

**Applications:** Oracle Cloud, OA Framework, Oracle ADF, Oracle eBusiness Suite, XML and BI Publisher

**Database:** MySQL, Oracle

\* indicates primary preference

## **CREATIVE INTERESTS**

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- Short-Film Making and Photography