

Ramy Mounir

RESEARCHER · THOUSAND BRAINS PROJECT

San Francisco, CA 94063

📞 813-397-9373 | ✉️ rmounir@thousandbrains.org | 🏠 ramymounir.com | 🌐 [ramyamounir](#) | 🎓 Scholar

Summary

An artificial intelligence researcher on the Thousand Brains Project, where we build neuroscience-inspired intelligent machines by reverse engineering the neocortex. My research focuses on the learning principles of the brain and the mechanisms underlying perception, reasoning, and prediction.

Research Interests: Computer Vision, Hierarchical Representation Learning, Computational Neuroscience, and Cognitive Psychology.

Education

University of South Florida

Tampa, FL

PhD, Computer Science and Engineering

2024

- Advisor: Dr. Sudeep Sarkar
- Research: Cognitive models, Self-supervised Representation Learning, Streaming datasets
- GPA: 4.0

University of South Florida

Tampa, FL

M.SC, Mechanical Engineering

2018

- Advisor: Dr. Redwan Alqasemi
- Co-Advisor: Dr. Rajiv Dubey
- Research: Assistive technology, autonomous navigation, Brain computer interface
- GPA: 4.0

University of South Florida

Tampa, FL

B.SC, Mechanical Engineering

2015

- Dean's list - All semesters
- Summa Cum Laude
- GPA: 3.96

Book Chapters

Self-supervised Event Segmentation, Ramy Mounir, Sathyanarayanan N. Aakur and Sudeep Sarkar. Advanced Methods and Deep Learning in Computer Vision (Ch.12), *Elsevier 2021*, ISBN: 9780128221099 [Chapter]

Publications

Predictive Attractor Models, Ramy Mounir, and Sudeep Sarkar. (*NeurIPS'24*) [paper] [website] [code]

STREAMER: Streaming Representation Learning and Event Segmentation in a Hierarchical Manner, Ramy Mounir, Sujal Vijayaraghavan and Sudeep Sarkar. (*NeurIPS'23*) [paper] [website] [code / docs]

Long-term Monitoring of Bird Flocks in the Wild, Kshitiz, Sonu Shreshtha, Ramy Mounir, Mayank Vatsa, Richa Singh, Saket Anand, Sudeep Sarkar, Severam Mali Parihar. (*IJCAI'23*) [paper] [website] [code]

Towards Automated Ethogramming: Cognitively-Inspired Event Segmentation for Streaming Wildlife Video Monitoring, Ramy Mounir, Ahmed Shahabaz, Roman Gula, Jörn Theuerkauf and Sudeep Sarkar. (*IJCV (CV4Animals@CVPR'22)*) [paper] [website] [dataset] [code / docs]

Time-Series Analysis of Video Graphs Using Joint Kalman Smoothing and Registration, Aditi Bal, Ramy Mounir, Sathyanarayanan Aakur, Sudeep Sarkar and Anuj Srivastava. (*ECCV'22 Oral*) [Paper] [website] [Video]

Spatio-Temporal Event Segmentation and Localization for Wildlife Extended Videos, Ramy Mounir, Roman Gula, Jörn Theuerkauf and Sudeep Sarkar. (*CVIP'21 (CV4Animals@CVPR'21 Oral)*) [Paper] [website] [Video]

BCI-Controlled Hands-Free Wheelchair Navigation with Obstacle Avoidance, Ramy Mounir, Redwan Alqasemi, and Rajiv Dubey. (*IROS'18 workshop Oral*) [Paper] [website] [Video]

Speech Assistance for Persons With Speech Impediments Using Artificial Neural Networks, Ramy Mounir, Redwan Alqasemi, and Rajiv Dubey. (*ISG'18 (ASME IMECE'17 Oral)*) [Paper] [website] [Slides]

Professional Experience

- 2025-Now** AI Researcher, Thousand Brains Project
2024-2024 Research Intern, Numenta
2023-2023 Computer Vision Research Intern, Mitsubishi Electric Research Labs (MERL)
2016-2024 Graduate Research and Teaching Assistant, Computer Science, USF
2014-2017 R&D engineer, EarthLinked Technologies, Inc.

Datasets

Bus Stop Tracking

<https://ramymounir.com/publications/BayesianTracking/>

2022

- 9000 Frames annotated with bounding box for over 25 actors
- Ids of actors are consistent across frames to be used for tracking evaluation
- The dataset features occlusions, partial and reappearing detections
- Video extracted from the Meva dataset

Kagu Wildlife Monitoring

<https://datadryad.org/stash/dataset/doi:10.5061/dryad.kh18932bb>

2021

- Ten days of continuous streaming of the Kagu bird various environmental and lighting conditions
- 23 million frames annotated with spatial bounding box
- 5 events annotated temporally (e.g., walk in/out, nest building, feeding)
- Annotations for various environmental and time-of-day conditions (e.g., shadows, sunrise, sunset, etc.)

Awards & Certificates

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| 2024 | Dissertation Completion Fellowship , USF | \$10,000 |
| 2022 | Outstanding Reviewer award , ECCV'22 | |
| 2022 | Highlighted Reviewer award , ICLR'22 | |
| 2018 | Robotics Graduate Certificate , USF | |
| 2017 | Early Innovation Award , Intel Corporation | \$5,300 |
| 2016 | Engineer in Training/ FE Mechanical , NCEES | |
| 2015 | Outstanding Graduate Award , University of South Florida | |
| 2015 | Certified LabVIEW Associate Developer , National Instruments | |
| 2014 | Certified Solidworks Associate (CSWA) , Dassault Systèmes | |

Reviewer

- 2025 ICLR,
2024 CVPR, NeurIPS, ECCV, ICLR, ICML, WACV,
2023 CVPR, TPAMI, ICCV, ICML, NeurIPS, WACV, IEEE RA-L,
2022 CVPR, ECCV, NeurIPS, ICLR, WACV, IEEE RA-L, ACMMM,
2021 CLVision@CVPR, ACMMM,

Blog Articles

- 2021 **Distributed Data Parallel with Slurm, Submitit & PyTorch**,

Medium

Invited Talks

Fall 2023. "Streaming Representation Learning and Event Segmentation in a Hierarchical Manner", Numenta

Spring 2023. "Event Segmentation for Wildlife Monitoring", CV grad class, USF

Fall 2021. "Self-Supervised Representation Learning", AI+X Seminar, USF

References available upon request.