Mohammad Samin Yasar

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EDUCATION

University of Virginia, Charlottesville, Virginia — Aug 2017 – Present
Ph.D. in Computer Engineering
Dissertation: **Enabling Human-Robot Collaboration through Representation Learning**

University of Virginia, Charlottesville, Virginia — Aug 2022
M.Eng. in Computer Engineering

BRAC University, Dhaka, Bangladesh — Apr 2015
B.Sc. in Electrical and Electronic Engineering

RESEARCH AND WORK EXPERIENCE

Collaborative Robotics Lab, University of Virginia — Jan 2020 – Present
Project: Enabling Human-Robot Collaboration through Representation Learning.
Led multiple projects between academia and industry on robot perception and robot control.
Proposed novel sequence learning algorithms that advanced the state-of-the-art in human motion prediction, work done in collaboration with CCAM.
Proposed a policy learning framework that interleaves planning with execution for robots, with performance improvement over state-of-the-art, work done in collaboration with NEC Labs.

Dependable Systems and Analytics Lab, University of Virginia — Aug 2017 – Dec 2019
Project: Detecting Adverse Events in Robotic Surgery in Real Time
Led cross-disciplinary research with surgeons and residents from UVA School of Medicine.
Proposed a safety monitoring system that detects unsafe events in robotic surgery.
Simulated realistic surgical robot failure modes using software fault injections.

Graduate Teaching Assistant, University of Virginia — Jan 2021 – May 2021
Course: Human-Robot Interaction
Co-instructed the hands-on laboratory classes of the course.
Developed assignments and lesson plans for the lab classes.
Conducted tutorial sessions and graded assignments.

AWARDS & RECOGNITION

UVA Career Center Distinguished Mentor — Aug 2023
Recognized for supporting and mentoring UVA students in their career development.

UVA Professional Development Award — Apr 2023
Awarded on the basis of Ph.D. impact, leadership and commitment to the UVA community.

UVA Engineering Research Symposium (UVERS) — Mar 2022, Mar 2023
Selected to present my Ph.D. work in the highly selective research symposium.

Human Robot Interaction Pioneers — Apr 2022
Selected as one of the HRI Pioneers 2022 for ongoing work in developing algorithms for robots to fluently collaborate with humans.

Double Hoo Research Grant Award — Mar 2022
Awarded for proposed research on enabling close-proximity human-robot collaboration.

Second place, ECE Research Poster competition, University of Virginia — Sep 2018
Awarded for research merit and presentation.

SKILLS

Machine Learning/Deep Learning
- TensorFlow
- PyTorch
- Scikit learn

Robotics
- ROS
- Gazebo

Computer Skills
- Programming Languages: Python, Java, C, C++
- Code Instrumentation: LLVM, Pin
- Others: UNIX/Linux, BASH, LaTeX

Computer Vision/Image Processing
- OpenCV
- Matlab

SELECTED PUBLICATIONS

JOURNALS

- **M. S. Yasar**, M. M. Islam, and T. Iqbal, "Imprint: Interactional dynamics-aware motion prediction in teams using multimodal context," ACM Transactions on Human-Robot Interaction (Impact Factor: 5.36). Under review for Minor Revision, 2023.
- M. M. Islam, **M. S. Yasar** and T. Iqbal, "MAVEN: A Memory Augmented Recurrent Approach for Multimodal Fusion," IEEE Transactions on Multimedia (Impact Factor: 8.13), 2022.
- **M. S. Yasar** and T. Iqbal , "A Scalable Approach to Predict Multi-Agent Motion for Human-Robot Collaboration," IEEE Robotics and Automation Letters (Impact Factor: 4.32), Presented at ICRA, 2021.

- S. M. Preum, S. Munir, M. Ma, **M. S. Yasar**, D. J. Stone, R. Williams, H. Alemzadeh, J. A. Stankovic, "A Review of Cognitive Assistants for Healthcare: Trends, Prospects, and Future Directions," ACM Computing Surveys (Impact Factor: 14.32), 2021.

CONFERENCES

- **M. S. Yasar**, and T. Iqbal, "VADER: Vector-Quantized Generative Adversarial Network for Motion Prediction," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023.
- **M. S. Yasar**, and T. Iqbal, "CoRaL: Continual representation learning for overcoming catastrophic forgetting," International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2023.
- **M. S. Yasar**, and H. Alemzadeh, "Real-Time Context-aware Detection of Unsafe Events in Robot-Assisted Surgery," 50th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2020.
- K. Hutchinson, **M. S. Yasar**, H. Bhatia and H. Alemzadeh, "A Reactive Autonomous Camera System for the RAVEN II Surgical Robot," International Symposium on Medical Robotics (ISMR), 2020.
- **M. S. Yasar**, D. Evans and H. Alemzadeh, "Context-aware Monitoring in Robotic Surgery," International Symposium on Medical Robotics (ISMR), 2019.

SELECTED TALKS

AAMAS - CoRaL: Continual Representation Learning for Overcoming Catastrophic Forgetting	Jun 2023
DC-AAMAS - Learning Transferable Representations for Non-Stationary Environments	Jun 2023
UVERS - Learning Transferable Representations for Non-Stationary Environments	Mar 2023
HRI Pioneers Workshop - Robots That Can Anticipate and Learn in Human-Robot Teams	Mar 2022
ICRA - A Scalable Approach to Predict Multi-Agent Motion for Human-Robot Collaboration	Jun 2021
LEAP-HRI - Improving Human Motion Prediction Through Continual Learning	Mar 2021
ISMR - Context-aware monitoring in Robotic Surgery	Apr 2019

PROFESSIONAL SERVICE

Organizer: RSS Workshop on Close-Proximity Human-Robot Collaboration	2022
Session Co-Chair: IEEE ICRA: Human-Robot Interaction Motion Planning	2021
Reviewer: ACM/IEEE International Conference on Human-Robot Interaction (HRI)	2021
Reviewer: ACM/IEEE International Conference on Human-Robot Interaction (HRI)	2021
Reviewer: IEEE Robotics and Automation Letters (RA-L)	2021, 2022
Reviewer: IEEE International Conference on Robotics and Automation (ICRA)	2020

ACADEMIC PROJECTS

Subject detection and tracking in a video (Code)
Extracted Histogram of Oriented Gradients (HOG) features from the initial video frame's designated template.
Trained a linear SVM classifier for subject discrimination.
Distinguished subject from background using distinctive HOG features.
Employed sliding window technique for spatial analysis in video frames.

Development of a surgical robot simulator (Code)
Developed a surgical robot simulator integrating the gazebo physics engine.
Achieved accurate replication of RAVEN II surgical procedures within a controlled virtual environment.
Introduced a virtual camera perspective, enabling recording of experiments from the surgeon's point of view.

Data-driven interface for detecting fraudulent transactions (Code)
Design a pipeline for data preprocessing and feature selection tailored for an unbalanced dataset.
Trained and validated different classifiers (kNN, SVM, XGBoost, Random Forest) using double cross validation.

Product Price Prediction from Images (Code)
Implemented a web crawler to create a dataset comprising of product images and product meta data.
Designed a product price predictor consisting of a pre-trained model extracting visual features.
Developed a fully-connected regressor for accurate product price prediction.

MENTORING EXPERIENCE

TJ Vitchutripop (CS Undergrad)
Robotics Institute Summer Scholar (RISS), Carnegie Mellon University 2023.
Louis T. Rader Outstanding Undergraduate Research Award 2023.
Double Hoo Research Grant Award 2022.

Wesley Lewis (CS Undergrad)
Robotics Institute Summer Scholar (RISS), Carnegie Mellon University 2023.
Dean's Summer Research Fellow 2022.

Brandon Yang (CS Undergrad)
Dean's Summer Research Fellow 2023.

TRAVEL GRANTS

AAMAS Travel Grant	2023
HRI Travel Grant	2022
DSN Travel Grant	2019
ISMR & SSMR Travel Grant	2019