

Maryam "Mary" Pourebadi

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RESEARCH INTERESTS

Robotics, Machine Learning, Artificial Intelligence, Human-Computer Interaction, Healthcare Engineering

EDUCATION

Ph.D. Student, Computer Science and Engineering 2022 (Expected)

University of California San Diego (UC San Diego)

Research Topic: "Innovating Interactive Expressive Robots and Virtual Agents for Healthcare Education"

M.S., Computer Science 2017

Kent State University (KSU)

Thesis: "A Deep Learning Approach for Blind Image Quality Assessment"

B.S., Computer Engineering 2014

Alzahra University (AU), Tehran

Thesis: "Developing an Artificial intelligence Algorithm for Tumor Detection in MRI Images of Breast"

AWARDS AND HONORS

Award Winner of Outstanding Graduate Leader, UC San Diego Graduate Student Association(GSA) 2020

Dean Chair of Social Hour Awardee, CSE UC San Diego 2020

ACM Richard Tapia Celebration of Diversity in Computing Scholar 2020

UC San Diego CSE Grace Hopper Celebration (GHC) Scholarship Awardee 2018, 2020

UC San Diego CSE ACM Richard Tapia Conference Scholarship Awardee 2019

Computing Research Association Women (CRA-W) Travel Grant Awardee 2019

Graduate Student Council Awardee, School of Engineering, UC San Diego 2018

National Science Foundation (NSF) Connections in Smart Health Student Travel Grant Awardee 2018

Graduate Student Senate (GSS) Domestic Travel Grant Awardee, KSU 2017

2nd Team Rank, Machine Learning Project Exhibition, KSU 2016

1st Team Rank, NASA Robotic Mining Competition, Robot Parade, KSU 2015

Best Student Paper Award at 5th AU Motion Festival 2014

1st Team Rank, Intelligent Vacuum Cleaner Competition, AU 2013

PUBLICATIONS

Refereed Conferences and Workshops

1. **Pourebadi, M.**, and Riek, L.D. (2020). "Stroke Modeling and Synthesis for Robotic and Virtual Patient Simulators", Proceedings of the AAAI Fall Symposium on Artificial Intelligence in Human-Robot Interaction: Trust & Explainability in Artificial Intelligence for Human-Robot Interaction (AAAI AI-HRI).
2. **Pourebadi, M.**, Gonzalez, C. G., LaBuzetta, J. N., Meyer, B. C., Suresh, P., Riek, L. D. (2020). "Mimicking Acute Stroke Findings With a Digital Agent", International Stroke Conference (ISC), Proceedings of the American Heart Association Journal (AHA).

3. Ghayoumi, M., and **Pourebadi, M.** (2019). "Fuzzy Knowledge-Based Architecture for Learning and Interaction in Social Robots", Proceedings of the AAAI Fall Symposium on Artificial Intelligence and Human-Robot Interaction: Service Robots in Human Environments (AAAI AI-HRI).
4. Moosaei, M., **Pourebadi, M.**, and Riek, L.D. (2019). "Modeling and Synthesizing Idiopathic Facial Paralysis", Proceedings of the IEEE International Conference on Automatic Face and Gesture Recognition (FG). [Acceptance rate: 20%]
5. **Pourebadi, M.**, and Riek, L.D. (2018). "Expressive Robotic Patient Simulators for Clinical Education", Robots 4 Learning workshop at the 13th Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI).
6. **Pourebadi, M.**, Pourebadi, M. (2016). "MLP Neural Network Based Approach for Facial Expression Analysis", Proceeding of the 20th International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV). [Acceptance rate: 24%]
7. Ghayoumi, M., Khan, J., **Pourebadi, M.**, Bauer, E., Hossain, A. (2016). "Follower Robot with an Optimized Gesture Recognition System", Proceedings of Socially & Physically Assistive Robotics For Humanity workshop at Robotics: Science and Systems (RSS).

Refereed Abstracts and Posters

8. **Pourebadi, M.**, Riek, L. D. (2020). "Modeling and Synthesizing Facial Expressions on Robots and Virtual Patient Simulators", The ACM Richard Tapia Celebration of Diversity in Computing (TAPIA).
9. **Pourebadi, M.**, Riek, L. D. (2020). "Reconstructing Dynamic Facial Motion Models of Expressions on Robots and Avatars", The UCSD CSE Research Open House.
10. **Pourebadi, M.**, Gonzalez, C. G., LaBuzetta, J. N., Meyer, B. C., Suresh, P., Riek, L. D. (2019). "Mimicking Acute Stroke Findings With a Digital Agent" poster, The International Stroke Conference (ISC), American Heart Association Journal (AHA).
11. **Pourebadi, M.**, Riek, L.D. (2019). "Expressive Robotic Patient Simulators: Facial Paralysis Synthesis for Virtual Patients" poster, The American Academy of Arts and Sciences (AAAS) DesignLab Event at UC San Diego.
12. **Pourebadi, M.**, Riek, L.D. (2019). "Enhancing Robotic Patient Simulators to Support the Clinical Workforce", The Southern California Robotics Symposium (SRC). [Selected for oral presentation, top 40% of papers]
13. **Pourebadi, M.**, Riek, L.D. (2019). "Improving Clinicians' Conception of Patients Using Expressive Robots", The Computing Research Association Grad Cohort for Women (CRA-W).

14. **Pourebadi, M.,** Riek, L.D. (2018). "Interactive, Expressive Robots for Medical Education", NSF Connections in Smart Health Workshop at the IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (NSF CHASE).
15. **Pourebadi, M.,** Riek, L.D. (2018). "Expressive Physical Robots in Dynamic Clinical Learning Environment", Healthcare Robotics workshop, Contextual Robotics Institute (CRI) Forum.
16. **Pourebadi, M.,** Lu, C. C., (2016). "Non-Distortion-Specific No-Reference Image Quality Assessment (IQA) using Deep Convolutional Neural Network", the 2nd Annual Machine Learning Project Exhibition at Kent State University (MLPE).

INVITED TALKS	1. CSE Research Open House at UC San Diego	2019 and 2020
AND DEMOS	2. American Academy of Arts and Sciences (AAAS) Design Lab Event at UC San Diego	2019
	3. Southern California Robotics Symposium (SRC'19)	2019
	4. CRA-W Grad Cohort Workshop	2019
	5. Contextual Robotics Institute Forum at UC San Diego	2018
	6. ACM/IEEE International Conference on HRI, Robots for Learning Workshop	2018
	7. Artificial Intelligence and Cancer Therapy Symposium	2014

RESEARCH
EXPERIENCE

Graduate Research Assistant, Healthcare Robotics Laboratory, UC San Diego 2017 - present

Interactive Expressive Robots for Clinical Education, NSF-funded project

- Created acute stroke digital avatars for use in simulated healthcare training
- Refined a physical Robot Patient Simulator (RPS) head that exhibits realistic expressions to improve clinician understanding of patient reactions
- Originated a novel framework for automatically synthesizing pain and other emotions of people with atypical expressions on nearly any physical robots or virtual avatars in real-time.
- Evaluated the efficacy of our RPS through experiments with clinical learners in live simulations

RoboCoach: Interactive Robotic Health Coach Assistant to Encourage Physical Activity

- Innovated a human activity monitoring system followed by an exercise feedback generating system
- Evaluated the efficacy of our robot in assisting people during interactive exercises by running a series of robotic-centric experiments

ResBot: Social Respite Care Robot to Support Mental Health

- Originated a human-friendly robot that employs face detection and voice-control navigation techniques to engage in conversation with people and relieve their stress.
- Constructed a control system consisting of four main modules: synthetic sound generation; human face perception; voice recognition, and localization, mapping, and navigation.
- Conducted a series of robotic-centric and human-centric experiments to evaluate the robot's performance

Graduate Research Assistant, Computer Vision and Image Processing Lab, KSU 2015 - 2017

Unsupervised Image Quality Assessment using Deep Convolutional Neural Networks (DCNN)

- Originated a non-distortion-specific, no-reference distorted image classifier using DCNN models
- Trained a network to estimate the quality of the distorted images using the properties of the human visual system to dynamically monitor and adjust the image quality of medical images

Recognizing Emotions in Facial Expressions Using Neural Networks

- Optimized geometric features of human's face for facial expression analysis
- Innovated an MLP model for effective, automatic analysis of facial expressions with a minimal set of facial feature points

Data Visualization of Daily Fluctuations of Expressions

- Built an artificial neural network (ANN) to detect subjects' faces and recognize expressions
- Engineered a dynamic data visualization tool to envision the daily fluctuations of individuals' expressions using data-driven documents and enable efficient exploration of feelings over time

PROFESSIONAL
EXPERIENCE

Web Application Developer at Noor Company, Tehran 2015

- Surveyed users, and gathered specifications and requirements based on technical needs for an online library website on cloud servers
- Launched a cloud-based platform (frontend and backend) to create and organize citations, and synchronize user's activities
- Annexed Identity and Access Management capabilities into the application to reduce security costs
- Instigated software documentation and final report of approaches for company liaison

API Developer and UX designer Intern at Hashie Web Design Studio, Tehran 2014

- Created website user interfaces by using standard HTML/CSS practices for online store websites
- Integrated data from various back-end services and databases

SUPERVISEES

Christine Lind, Ph.D. Cognitive Science 2019

Vale Gonzalez, B.S. Computer Science and Engineering 2019

Victoria Hoznek, B.S. Human Biology, Double Minor Psychology and Visual Art 2018 - 2019

Andy Ma, B.S. Mechanical Engineering 2017 - 2018

Jon Paden, MFA. Art Theory 2017 - 2018

PRESS

IEEE Spectrum, Video Friday: Cassie's Star Wars AT-ST Costume, and More. Your weekly selection of awesome robot videos Nov 2018

NanoTech Channel, Jacobs Graduate Student Council interview with Maryam Pourebadi Oct 2018

STEM Pardazesh Magazine, Maryam Pourebadi: A successful woman in technology shares advice on entering the STEM community Jul 2018

Kent Starter & TV2: KentWired News, Students create robots, prepare for competition Dec 2015

TEACHING
EXPERIENCE

Graduate Teaching Assistant, KSU

1. Network Security Su 2017
2. Introduction to Computer Science Sp 2017
3. Discrete Structures Sp 2017, Fa 2016
4. Algorithms and Programming Fa 2016
5. Data Structures and Abstraction Su 2016
6. Procedural Programming Su 2016
7. Object Oriented Programming Su 2016
8. Introduction to Computer Science Sp 2016
9. Wireless Communication Networks Fa 2015

Undergraduate Teaching Assistant, AU

10. Web Programming Fa 2015
11. Data Structures Fa 2013, Fa 2014
12. Introduction to Formal Languages and Automata Fa 2013
13. Discrete Mathematics Sp 2013
14. Fundamentals of Computer Science and Programming Fa 2011
15. Technical Language Fa 2011

Technical Program
Committee Member

- Program committee member**, AAAI Fall Symposium on Artificial Intelligence for Human-Robot Interaction (AAAI AI-HRI) 2020
- Reviewer**, ACM/IEEE International Conference on Human-Robot Interaction (HRI) 2019, 2020
- Reviewer**, Cognitive Science Society (Cogsci) 2018, 2019
- Volunteer**, HRI 2020 Program Committee Meeting 2019

LEADERSHIP

- Co-Chair**, CSE K-12 outreach program, UC San Diego 2019 - 2020
- Co-Coordinator**, CSE Mentorship Program, UC San Diego 2018 - 2019
- Vice Senator**, The Graduate Student Senate, KSU 2016 – 2017
- Direct Manager**, Computer Science and Information technology Magazine 2012 – 2014
- Senator**, Computer Engineering Society, AU 2012 – 2013
- President**, Computer Science and Engineering Research Committee, AU 2011 – 2013

SERVICE

- Elected board member**, UCSD Graduate Women In Computing (GradWIC) 2018 - 2020
- Judge**, VEX Robotics Competition, Robotics Education and Competition Foundation 2018, 2019
- Committee member**, Diversity Equity and Inclusion (DEI) 2017 – 2018
- Volunteer**, RoboGrads Community, UC San Diego 2018
- UCSD IEEE fellow Judge**, The SumoBot competition, UC San Diego 2017

Mentor , SD Hackathon, UC San Diego	2017
Committee member , Faculty Candidate Student Panel, UC San Diego	2017
Committee member , Student Committee for Ph.D. Admissions, UC San Diego	2017
Committee member , CS GSA Graduate Student Association, KSU	2015 – 2017
Mentor and Judge , Robot Parade Competition, Kent State University	2016
Organizer , "A Day with Physics Congress", IUST, Tehran	2013
Organizer , IT's Role in Global Marketplace Seminar, AU	2012
Organizer , Research Methodology workshop, CSE Department, AU	2010
Team Leader , AU Robotic Team, 3D Soccer Simulation	2010

PROFESSIONAL
AFFILIATIONS

Association for Computing Machinery (ACM) & ACM Committee on Women	2017 – present
IEEE Robotics and Automation Society (IEEE-RAS)	2016 – present
IEEE Women in Engineering	2016 – present
IEEE Transactions on Affective Computing	2020 – present
Society for Industrial and Applied Mathematics (SIAM)	2017 – 2019

PROFESSIONAL
COMPETENCIES

Software/Programming Languages: ROS, Python, MATLAB, C#, C++, C, AVR 8086, Lua, Torch

Microcontrollers: Arduino, Raspberry Pi

Visualization Software: Tableau, Data-Driven Documents (D3.js)

Web/Database Development Tools: ASP.NET, JavaScript, HTML5, CSS3, PHP, Ajax, SQL Server