Marwan Abdelatti

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RESEARCH INTERESTS

- Intelligent Systems.
- Robotics.
- Parallel Computing

EDUCATION

- Postdoc in industrial engineering, University of Rhode Island, RI, US, Jan. 2023 to date.
- Ph.D. Department of Industrial Engineering, University of Rhode Island, RI, US Dec. 2022
- M.Sc. in Electronics and Communications Engineering, Cairo University, Egypt 2014
- B.Sc. in Electrical Engineering, Minya University, Egypt 2005

ACADEMIC EXPERIENCE

- Adjunct Professor of Mathematics & Computer Science Department, Providence College, Providence, RI, USA Sep 2023 to date.
- Postdoctoral research fellow in Industrial Engineering, University of Rhode Island, Kingston, RI, USA Jan. 2023 to date.

PAST WORK EXPERIENCE

- Research and Teaching Assistant, University of Rhode Island, Kingston, RI, USA Jan. 2017 – Dec. 2022.
- AI Lab Research Associate, University of Rhode Island, Kingston, RI, USA, Jan. 2017 – Aug. 2019.

PROFESSIONAL INDUSTRIAL EXPERIENCE

- Automation Commissioning Engineer, National Grid, Riyadh, Saudi Arabia Aug. 2014 – Jan. 2017.
- Lead Automation Engineer, Protection & Control Group, Cairo, Egypt Dec. 2011 – Aug. 2014.

- Automation Systems Engineer, National Grid, Minya, Egypt Nov. 2005 – Dec. 2011.

HONORS AND AWARDS

- **RESEARCH**
- **FELLOWSHIPS**
    - Teaching Fellowship in Industrial Engineering at the University of Rhode Island, Sep. 2018 – Dec. 2022.
    - Beyond Professoriate Graduate Student Professional Conference Scholarship (Ranked 1st in university competition), University of Rhode Island, May 2018.
    - Research Fellowship in Mechanical Engineering at the University of Rhode Island, Jan. 2017 – Dec. 2017.
    - Student Fellowship (Ranked 1st in university competition), Minya University, Egypt 2000 - 2005.
- **CONFERENCES**
- **TEACHING**

GRANTS

- National Institute for Undersea Vehicle Technology (NIUVT), "Next-Gen Naval Manufacturing". Submitted with Manbir Sodhi (PI) and Farhad Imani (CoPI) – (Submitted).
- Department of Energy, DE-FOA-0002897: "Improving the Economics of Recycling Consumer Electronics Batteries". Submitted with Manbir Sodhi (PI) and Kunal Mankodiya – (Submitted).

PUBLICATIONS

Book Chapters

Abdelatti, M. & Sodhi, M. (2023). Lab-Scale Smart Factory Implementation Using ROS. In Robot Operating System (ROS) The Complete Reference (Volume 7) (pp. 119-143). Cham: Springer International Publishing.

Peer-Reviewed Journal Papers

Abdelatti, M., Yuan, C., Zeng, W., & Wang, C. (2018). "Cooperative deterministic learning control for a group of homogeneous nonlinear uncertain robot manipulators". Science China Information Sciences, 61(11), 1-19.

Peer-Reviewed Conferences Papers

C1. Heer, M., Jose Quevedo, **Marwan Abdelatti,** Resit Sendag & Manbir Sodhi. "Efficient implementation of a Genetic Algorithm for the Capacitated Vehicle Routing Problem on a High-Performance FPGA". In 2023 IEEE 31st Annual International Symposium on Field-Programmable Custom Computing Machines (FCCM).

C2. **Abdelatti, M. F.,** Sodhi, M., & Sendag, Resit. "A Multi-GPU Parallel Genetic Algorithm For Large-Scale Vehicle Routing Problems". In proceedings of the 2022 IEEE High Performance Extreme Computing Conference.

C3. **Abdelatti, M. F.** & Sodhi, M. S. "An improved GPU-accelerated heuristic technique applied to the capacitated vehicle routing problem. In Proceedings of the 2020 Genetic and Evolutionary Computation Conference (pp. 663-671).

C4. Chengzhi, Y., **Marwan, A.,** Xiaonan, D., Wei, Z., Paolo, S., & Chang, D. "Cooperative deterministic learning control of multi-robot manipulators". In 2018 37th Chinese Control Conference (CCC) (pp. 2824-2829). IEEE.

C5. Quevedo J., **Marwan, A.,** Farhad, I., & Manbir, S. "Using reinforcement learning for tuning genetic algorithms". In Proceedings of the Genetic and Evolutionary Computation Conference Companion (GECCO '21). Association for Computing Machinery, New York, NY, USA, 1503–1507.

Peer-Reviewed Posters, Abstracts, and Demo Papers

MS1. Quevedo, J., Maximilian Heer, **Marwan Abdelatti,** Resit Sendag & Manbir Sodhi. "Performance Comparison of Steady State GAs and Generational GAs for Capacitated Vehicle Routing Problems". In Proceedings of the 2023 Genetic and Evolutionary Computation Conference -- Approved submission.

MS2. **Abdelatti, M.,** Hendawi, A., & Sodhi, M. "Optimizing a GPU-Accelerated Genetic Algorithm for the Vehicle Routing Problem". In 2021 Genetic and Evolutionary Computation Conference Companion (GECCO'21 Companion).

MS3. Fellers, J., Quevedo, J., **Abdelatti, M.,** Steinhaus, M., & Sodhi, M. "Selecting between evolutionary and classical algorithms for the CVRP using machine learning: optimization of vehicle routing problems". In Proceedings of the Genetic and Evolutionary Computation Conference Companion (pp. 127-128).

Invited Talks:

IT1. April 2024, Computationally Enhanced Projects, **University of Rhode Island**, Kingston, RI.

IT2. April 2024, Statistical Analysis and Experiments for Computer Science, **University of Rhode Island**, Kingston, RI.

IT3. May 2023, 5th ECBE Research Showcase, **University of Rhode Island**, Kingston, RI.

IT4. April 2018, Rhode Island Robot Block Party 2018, **Brown University**, Providence, RI.

• Funding (2019-present)

Current grants

Total extramural funding brought to URI as a Principal Investigator or Co-Principal Investigator: <u>$3 million+</u>

G1. **Principal Investigator at URI**, *MINDER: Wearable Sensor-Based Detection of Digital Biomarkers of Adherence to Medications for Opioid Use Disorder*, Subaward from the University of Massachusetts Medical School (UMMS) as part of an NIH R01 grant Amount: **$1.6 million (URI share)** (6/2023-5/2027)

Project Principal Investigator: Stephanie Carreiro, UMMS; *Other Principal Investigator:* Kunal Mankodiya, URI; *Co-Principal Investigator:* Dhaval Solanki, URI

G2. **Principal Investigator at URI**, *Smart Steps: A Context-Aware Adherence Intervention to Improve PrEP Adherence Among Men who have Sex with Men (MSM) with Substance Use Disorder*, Subaward from Brigham and Women's Hospital (BWH) as part of an NIH Avenir grant
Amount: **$409,722 (URI share)** (4/2022-3/2026)
Project Principal Investigator: Peter Chai, BWH

G3. **Principal Investigator**, *Technology to Facilitate Dyadic Peer Support and Autonomous Self Care for People with Intellectual Disabilities Post Trauma*, Massachusetts Disabled Persons Protection Commission (DPPC)
Amount: **$114,238** (11/2021-9/2023)

G4. **Co-Principal Investigator**, *EAGER: Towards a Multimodal Smart Textile Medical Monitoring System For Neonatal ICUs*, National Science Foundation (NSF) SCH
Amount: **$299,998** (10/2021-9/2023).
Project Principal Investigator: Kunal Mankodiya, URI; *Co-Principal Investigator:* Yalda Shahriyari, URI

G5. **Principal Investigator**, *SaTC: CORE: Small: A Suite of Authentication Solutions for Individuals with Upper Extremity Impairment*, National Science Foundation (NSF) Secure and Trustworthy Cyberspace (SaTC)
Amount: **$499,995** (7/2019-09/2024) [no cost extension])

- *REU Supplement*, National Science Foundation (NSF) Secure and Trustworthy Cyberspace (SaTC)
  Amount: **$16,000** (5/2020-8/2020)

G6. **Principal Investigator**, *Technology Enhanced Actions in Massachusetts Adult Protective Services (TEAM APS): Recognize, Report, and Respond (R3)*, Massachusetts Disabled Per- sons Protection Commission (DPPC)
Amount: **$270,235** (9/2019-8/2023)

- **Impact and RecognitionHonorable Mention**

Honors and Awards

HS1. Honorable Mention Award at the ACM CHI Conference on Human Factors in Computing Systems (CHI '23), Hamburg, Germany, 2023

HS2. Honorable Mention Award at the ACM CHI Conference on Human Factors in Computing Systems (CHI '21), Yokohama, Japan, 2021

HS3. Co-Best Paper Award at the 8th Annual Collaboration, Electronic Messaging, Anti-Abuse, and Spam Conference (CEAS' 11), Perth, Australia, 2011

HS4. Best Paper Award at the 4th International Conference on Intelligent Sensing and Information Processing (ICISIP '06), Bangalore, India, 2006

HS5. Departmental Honors for outstanding achievement in the Department of Mathematics & Computer Science, Webster University, 2001

Press Coverage

PC1. My research on developing an developing authentication tool for people with upper extremity impairment has been covered by the Boston Globe in **December 2020** (https://www.bostonglobe.com/2020/12/28/metro/uri-researcher-aims-help-people-with-disabilities-access-computers-smartphones/). The article was also published in the print version of newspaper on January 4, 2021

PC2. I was featured in the URI Momentum magazine (Fall 2020 issue) in an article on transition to virtual classroom during COVID-19 in **December 2020** (https://web.uri.edu/research-admin/externalrelations/current-research-magazine/)

PC3. I was interviewed for the 5pm news broadcast from *Providence's NBC affiliate,* ***WJAR***. The story discussed on the implications of Apple and Google's COVID-19 exposure tracking app, **May 2020**. https://turnto10.com/news/local/as-tech-giants-collaborate-on-contact-tracing-system-concerns-over-privacy-arise

PC4. My research on developing an abuse reporting tool for people with intellectual and developmental disability has been covered in **February 2020**.

- **The Boston Globe** (https://www.bostonglobe.com/2020/02/28/metro/if-we-dont-take-action-who-will/)
- **Boston Herald** (https://www.bostonherald.com/2020/02/21/team-of-academics-working-to-develop-app-to-help-people-with-disabilities-report-abuse/)
- **Providence Business Network** (https://pbn.com/uri-professor-developing-abuse-reporting-app-to-help-people-with-intellectual-disabilities/)

PC5. I was interviewed for an article titled "Say Goodbye to Your Keyboard" for *HP Enterprises Insights magazine*. The story discussed how the advent of IoT and wearables will bring about new ways of interacting with them, **August 2017**. https://insights.hpe.com/articles/say-goodbye-to-your-keyboard-1708.html

PC6. I was interviewed for the 11pm news broadcast from *Boston's CBS affiliate,* ***WBZ***. The story discussed "Internet of Things" devices and their cybersecurity risks, **Dec. 2015**. http://boston.cbslocal.com/2015/12/10/i-team-wifi-enabled-toys-could-put-your-privacy-at-risk/

PC7. I was interviewed by *Clinical innovations and Technology magazine* about my body area networks research, **April 2013**. http://www.clinical-innovation.com/topics/technology-management/medical-body-area-networks-challenges-and-opportunities

PC8. My research has been mentioned in *IEEE Engineering in Medicine and Biology journal* article on wearable technology vol. 29, issue 3, **May/Jun 2010**

PC9. My research has been featured on Discovery Channel's *Discovery Tech website*, **2009**

PC10. My research has been featured in *ACM Tech News*, **2007**

Apps Released

AP1. My research (supported by the grant G6) on empowering people with intellectual and developmental disabilities (I/DD) to recognize and report abuse has resulted in an app called R3: Recognize, Report, Respond, which is available as of **June 2023** on the Apple and Amazon app store.:

- The Apple app store (https://apps.apple.com/us/app/r3-recognize-report-respond/id6446331248)
- The Amazon app store (https://www.amazon.com/Disabled-Persons-Protection-Commission-Recognize/dp/B0C6VG4YNC/

TEACHING

- **INSTRUCTOR**
  - ISE 311/MCE 411: Probability and Statistics for Engineers (Undergrad Level), University of Rhode Island, Summer 2023.
  - CSC 104: Software Development (Undergrad Level), Providence College, Fall 2023 - Spring 2024
- **TEACHING ASSISTANCE**
  - ISE 401/402: Capstone Design (Undergrad Level), University of Rhode Island, Fall 2018 – Fall 2022.
- **Mentor/Supervisor/Co-advise**

Co1. CSC212: Data Structures and Abstractions (undergraduate)

Co2. CSC592: Human Computer Interaction (graduate)

Co3. CSC320: Social Issues in Computing (undergraduate)

Co4. CSC492: Human Computer Interaction (undergraduate)

- **Advising (2019-present)**

Doctoral Dissertation Advising

DR1. Arlen Dumas. "Digital Phenotyping to Predict PrEP adherence among men who have sex with men (MSM) with substance use disorder (Provisional title)," *Expected completion:* Spring 2027

DR2. Piriyankan Kirupaharan. "Designing VR-based Self Regulation Solutions for People with Intellectual and Developmental Disabilities (Provisional title)," *Expected completion:* Spring 2026

DR3. Brittany Lewis. "Designing Accessible Computing Device Authentication for People with Upper Extremity Impairment," **Completed: July 2023**

Master's Thesis Advising

MT1. Derek Jacobs. "Predicting Pain Presence in ICU Patients Using Physiological Signals," **Completed: Spring 2022**

MT2. Thomas Howard III. "An Abuse Refresher Tool for People With Intellectual and Developmental Disability," **Completed: Fall 2020**

MT3. Ethan Kulman. "Identifying Opioid Withdrawal Using Wearable Biosensors," **Com-**

pleted: Summer 2020

Undergraduate Project Advising

CP1. Michael Martel. “Side-Channel Information Leaks in Assistive Switches,” *Completed:* Fall 2019. (Research credit project)

CP2. Sean Polin. “Side-Channel Information Leaks in Assistive Switches,” *Completed:* Fall 2019. (Research credit project)

CP3. Haochi Du. “Proximity-Based Authentication for People With Upper-Extremity Impairment,” *Completed:* Summer 2020. (NSF REU supplement project)

CP4. Alexandra Gourley. "Understanding Safety-Critical Smart-Home Device Use by People With Disabilities," *Completed:* Summer 2020. (NSF REU supplement project, which led to a **CHI '23 paper that received an Honorable Mention Award [C1**])

CP5. Jack Lanoie. "User Study of an Abuse Recognition Tool for People With Intellectual Disabilities," *Completed:* Spring 2021 (Research credit project)

CP6. Alexander Sinapi. "Designing A Response/Grounding Tool for People With Intellectual Disabilities," *Completed:* Spring 2021. (Research credit project)

CP7. Jason Lao. "Investigating Voice Assistant to Train People with Intellectual Disabilities To Call 911," *Completed:* Fall 2021. (Research credit project)

CP8. Paige Courtemanche. "Understanding Computing Use by People with Upper-Extremity Impairment during the COVID-19 Pandemic," *Completed:* Summer 2021. (The project led to a **CHI '22 Late Breaking Work paper [C3]**)

CP9. Sierra Obi. "Understanding Credential Sharing Among People With Upper-Extremity Impairment," *Completed:* Summer 2021. (A&S Fellowship project)

CP10. Arlen Dumas. "Data Curation for Building Pain Prediction Machine Learning Models for ICU Patients," *Completed:* Spring 2022. (Research credit project)

CP11. Andrew Laraw Lama. "Adding Accessibility to an Abuse Recognition Tool for People With Intellectual Disabilities," *Completed:* Fall 2022. (Research credit project)

CP12. Liam Cannon. "Real-world deployment of an Abuse Recognition Tool for People With Intellectual Disabilities," *Completed:* Spring 2023. (Research credit project)

CP13. Thomas Fargnoli. "Testing Strategies for an Abuse Recognition Tool for People With Intellectual Disabilities," *Completed:* Spring 2023. (Research credit project)

• Professional Society Memberships and Offices

PS1. Member. Association of Computing Machinery (ACM)

PS2. Member. Special Interest Group on Computer Human Interactions (SIGCHI)

PS3. Member. Special Interest Group on Accessible Computing (SIGACCESS)

PS4. Member. Institute of Electrical and Electronics Engineers (IEEE)

• Panels

PL1. Panel Member. "Showcasing R3: An App That Teaches People With Intellectual And Developmental Disabilities About Abuse," North American Conference on Adult Protective Services (NAPSA), Boston, MA, August 2023 (*Forthcoming*)

PL2. Panel Member. "Evaluating an App That Teaches People With Intellectual and Developmental Disabilities About Abuse," North American Conference on Adult Protective Services (NAPSA), Grand Rapids, MI, September 2022

PL3. Panel Member. "Co-Designing an App With People With Intellectual And Developmental Disabilities That Teaches The Community About Abuse," North American Conference on

Adult Protective Services (NAPSA), San Diego, CA, November 2021

PL4. Panel Member. “Social Issues and Technology,” CS4RI Summit. Virtual Event, December 2020.

PL5. Panel Member. “Reports from Inside: Massachusetts Leading Cybersecurity R&D Initiatives,” MA Cyber Security Forum, Boston, MA, September 2018

PL6. Panel Member. “Improving Patient Care With Medical Robotics,” LiveWorx Technology Conference, Boston, MA, May 2017

PL7. Panel Member. “Internet of Things: Where Things Stand?,” Matlab Research Summit, Netwon, MA, June 2016

PL8. Organizer and Moderator. “Securing Medical Cyber-Physical Systems: Challenges and Future Directions,” 10th International Symposium on Medical Information and Communi- cation Technology (ISMICT’16), Worcester, MA, March 2016

PL9. Organizer and Moderator. “Security in Medical Cyber Physical Systems,” ACSAC 2013, New Orleans, LA, December 2013

• Editorial and Referee Activities (2019-present)

Journal Editorship

JE1. Review Editor, *Frontiers in Electronics - Wearable Electronics*, 2020 - present

JE2. Associate Editor. *Elsevier Smart Health Journal*, 2016 - present

JE3. Editorial Board Member. *International Journal of Security and Networks (IJSN)*, 2015 - 2021

Technical Program Committee Member

TC1. ACM/IEEE Conference on Connected Health (CHASE)

TC2. International Symposium on Visual Computing

TC3. International Workshop on Data Analytics for Smart Health: DASH

TC4. IEEE Workshop on Smart Service Systems

TC5. Transdisciplinary AI conference

TC6. IEEE COMPSAC, Smart and Connected Health Symposium

TC7. International Conference on Communication Systems & Networks (COMSNETS)

TC8. IEEE International Conference on Security and Privacy for Body Sensor Networks

Conference Reviewer

CA1. IFIP International Conference of Technical Committee 13 (Human- Computer Interaction) - Interact

CA2. ACM CHI Conference on Human Factors in Computing Systems

CA3. ACM SIGACCESS Conference on Computers and Accessibility

CA4. ACM ACM International Conference on Multimodal Interaction

Journal Reviewer

RE1. SAGE Field Methods

RE2. MDPI Applied Science

RE3. IEEE Internet of Things Journal

RE4. ACM Transactions on Computing for Healthcare

RE5. MDPI Sensors

RE6. Security and Communication Networks

Grant Proposal Reviewer

GR1. National Science Foundation (NSF): Panelist (2019, 2020, 2021)

GR2. National Institute on Disability, Independent Living, and Rehabilitation Research (NI-DILRR): Panelist (2021)

- ## Service to Department of Computer Science and Statistics at URI

SD1. **Director, Graduate Committee**, AY 2023

SD2. **Member, Faculty Search Committee**, AY 2022

SD3. **Member, Graduate Committee**, AY 2020 - AY 2022

SD4. **Member, Diversity Committee**, AY 2020 - present

SD5. **Member, Ad-hoc Data Science Committee**, AY 2020, AY 2021

SD6. **Member, Undergraduate Committee**, AY 2019

SD7. **Member, Faculty Search Committee**, AY 2019