

# Anas Abou Allaban

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## RESEARCH EXPERIENCE

### **Robotics and Intelligent Vehicles Research Lab**, Northeastern University

*Research Assistant, Advisor: Prof. Taskin Padi*

Jul 2016 – Present

- Worked with **Dr. Velin Dimitrov** to support his thesis on human-in-the-loop cyber-physical systems. Designed an experiment using a Turtlebot & Clearpath Jackal to analyze the performance of a blended shared control architecture and its effect on human-robot team performance. Presented at **RISE 2017** and submitted to **ICRA 2019**.
- Worked with PhD student **Tarik Kelestemur** to lead & mentor a group of undergraduate students to support the development of Toyota's Human Support Robot. I designed & developed **DialogflowROS**, a speech interface system with hotwords and context sensitive grammar using Google's Speech & NLP APIs. Our team participated in Robocup@Home2017/18 and was invited to the World Robot Summit 2018. We placed 4th internationally and best in the USA. Presented at **MIT IEEE URTC 2018**.

### **Integrated Human-Machine Systems Lab**, Northeastern University

*Research Assistant, Advisor: Prof. Yingzi Lin*

Nov 2015 – Jun 2016

- Supported graduate student Li Wang's project on the use of EEG sensors to interface with robots using SVM classifiers. Submitted to **ACC 2016**.
- Researched the effects of cold pain on physiological signals by designing an experiment to measure pain tolerance. Presented at **RISE 2016**.

### **Mechatronics Research Lab**, Massachusetts Institute of Technology

*Research Intern*

Sep 2014 – Feb 2015

- Supported **Prof. Kamal El-Toumi** and **Dr. Iman Soltani's** project on car and pedestrian detection in autonomous vehicles for Ford through a literature survey. Trained BRISK, FAST, and SURF classifiers using Matlab and analyzed performance, accuracy, and tradeoffs of each feature extractor.

## WORK EXPERIENCE

### **Arçelik**, Istanbul, Turkey

*Robotics R&D Intern*

Jul 2018 – Present

- Conducted a market analysis and systematic review on state-of-the-art literature in home robotics and smart homes. Presented results to executives and research managers.
- Designed and prototyped proof-of-concept robot technologies including a clutter cleaning robot.
- Wrote a technology road map for a future research/product ecosystem at Arçelik, creating projects for future coops as well.

### **iRobot**, Bedford, MA

*Lead Systems Test Intern*

May 2017 – Dec 2012

- Designed an optoelectronic test fixture for iRobot's home-based product line which identified critical docking issues in old generation Roombas. Updated optoelectronics resulted in increased docking performance across the product line.
- Trained & assisted interns with on-boarding, power tools, software, and electronics. Ran workshops to train interns on tools like ROS.
- Designed, built, and maintained test fixtures by programming MCUs, designing electronic circuits, and machining & printing parts.
- Wrote a shape, color, and face detection program for iRobot's future STEM product using OpenCV.
- Wrote LabView programs that collected sensor data from iRobot's future products to validate new features.

### **Neuro Behavioral Center**, Walpole, MA

*Partner & Co-Founder*

Aug 2014 – Present

- Established a psychiatric clinic, setting up operations including finance, HR, and legal structure.
- Wrote employee training manual, handbook, and company policy.
- Currently focused on monitoring financial performance and clinic budget.

<b>EDUCATION</b>	<b>Northeastern University</b> , Boston, MA	
	B.S. in Electrical and Computer Engineering <span style="float: right;">Exp. Apr 2019</span> <ul style="list-style-type: none"> <li>Concentration: Robotic systems, kinematics, and dynamics.</li> <li>Minor: Mathematics</li> <li>Dean's List (All Semesters)   Cumulative GPA: 3.89 / 4.0</li> </ul>	
<b>SKILLS</b>	<b>Programming</b>	
	<ul style="list-style-type: none"> <li><b>Experienced (3+ years)</b> C/C++, Python, MATLAB, Simulink, HTML\CSS.</li> <li><b>Proficient (1+ years)</b> JavaScript, LabView, Verilog, Bash Scripting, MIPS Assembly, <math>\LaTeX</math>.</li> </ul>	
	<b>Platforms</b>	
	ROS, Linux, Tensorflow, SkLearn, Numpy, Pandas, Matplotlib, OpenCV, Git, NI DAQs	
	<b>Applications</b>	
	OrCAD/PSPICE, Eagle PCB, Solidworks, Jira (Agile), AutoCAD.	
	<b>Fabrication</b>	
	CNC Milling, Manual Milling & Turning, Soldering & Crimping, Rapid Prototyping.	
<b>PUBLICATIONS</b>	[1] <u>A. Abou Allaban</u> , V. Dimitrov, and T. Padir, "A blended human-robot shared control framework to handle drift and latency," Submitted to <i>Int. Conf. on Robotics &amp; Automation</i> , 2019.	
	[2] <u>A. Abou Allaban</u> , T. Kelestemur, N. Yokoyama, and T. Padir, "A System Architecture for Mobile Robots in a Home Environment: Team Northeastern's Approach for Robocup@Home," Presented at <i>IEEE MIT Undergraduate Research Tech. Conf.</i> , Boston, MA, USA, Oct 2018.	
	[3] <u>A. Abou Allaban</u> and T. Padir, "Performance Evaluation of a Blended Shared Controller in Human-Robot Teams," in <i>Research and Innovation Student Expo</i> , Boston, MA, USA, Apr 2017.	
	[4] Y. Lin, L. Wang, and <u>A. Abou Allaban</u> "A Feature Extraction and Classification Algorithm for ERD/ERS-based classification in a Brain-Computer Interface system," in <i>Proceedings of the American Control Conference</i> , Boston, MA, Jul 2016.	
<b>AWARDS &amp; SCHOLARSHIPS</b>	Northeastern Presidential Global Scholarship <span style="float: right;">Jul 2018</span>	
	Award given to Northeastern students with a high caliber of academic excellence seeking to pursue a global co-op opportunity.	
	Northeastern Excellence Scholarship <span style="float: right;">2015 – 2019</span>	
	Scholarship awarded for students who have academically excelled in their coursework.	
	Best/Outstanding Delegate <span style="float: right;">Nov 2014 – Jul 2015</span>	
	Awarded to MUN delegates that showcase the best debating and leadership skills.	
	Awarded at MITMUNC, UMass Amherst MUN, UNAGB MAL & RMUN.	
	1st place ADNOC Regional Science Fair <span style="float: right;">Jan 2014</span>	
	Awarded for designing a system for controlling a robot with gestures using a Microsoft Kinect.	
<b>PROFESSIONAL AFFILIATIONS &amp; ACTIVITIES</b>	<b>IEEE RAS - Northeastern Student Chapter</b> , Boston, MA	
	<i>Founder, President</i> <span style="float: right;">Jul 2018 – Present</span>	
	Established an IEEE RAS Student Branch Chapter. Conducted workshops on robotic technologies, invited speakers from industry & academia, and collaborated with research labs to connect students with research projects.	
	<b>Al-Noor Academy Model UN</b> , Mansfield, MA	
	<i>Founder, Advisor</i> <span style="float: right;">Mar 2014 – Present</span>	
	Established an MUN organization at the Glenelg School of Abu Dhabi, paving the way for a major student led group with 150+ members. A similar organization was introduced at Al-Noor Academy. Currently assisting in an advisory role.	
	<b>IEEE HKN - Gamma Beta Chapter</b> , Boston, MA <span style="float: right;">2018 – Present</span>	
	<b>Tau Beta Pi Engineering Honor Society</b> , Boston, MA <span style="float: right;">2018 – Present</span>	
<b>LANGUAGES</b>	<ul style="list-style-type: none"> <li>Native: English, Arabic</li> <li>Intermediate: Turkish</li> </ul>	