

Pooya Abolghasemi

DEEP LEARNING · ROBOTICS · SOFTWARE ENGINEERING

Orlando, Florida

☎ (+1) 4076834041 | ✉ pooya.abolghasemi@gmail.com | 🏠 pabolghasemi.com | 📱 pouyaAB | 🌐 pabolghasemi

Summary

Research Scientist with 4+ years of experience in **Deep Learning, Machine Learning, Robotics**. Experienced with most programming languages over 10+ years. Currently working with a start-up company that augment simple, low budget robots with AI and a programming interface. **Ph.D. in Computer Science**.

Education

PhD in Computer Science University of Central Florida, 2014 - 2019

B.Sc. in Computer Eng University of Tehran, 2009 - 2014

Computer Skills

Programming Languages **Comfortable with:** Python, Java, JavaScript. **Familiar with:** C/C++, C#, Swift

ML Frameworks Tensorflow, PyTorch, Chainer

Databases MySQL, Microsoft SQL Server

Other ROS, HTML, CSS, jQuery, Jupyter Notebooks, Git, Unity, Docker, OpenGL, GameMaker

Experience

Ximpatico Inc.

Orlando, FL

RESEARCH SCIENTIST

Summer 2019 - Present

- Developed a **smart, autonomous, programmable**, and remote control robot. Nabot is an **educational** robot to interest the next generation in AI. I worked on both **Android** and **iOS** applications. I integrated Google **Blockly** as the coding interface for the robot. I augmented the application with deep learning models to perform **object detection, object classification**, and **Depth estimation**. Check it out on **Kickstarter**: <https://bit.ly/3b3YBmn>
- **Technologies:** Tensorflow, Pytorch, TFLite, PyTorch Mobile, Android, iOS

University of Central Florida

Orlando, USA

PHD STUDENT - MACHINE LEARNING AND ROBOTICS

2014 - 2019

- Published the **state of the art papers** in Robotics, Machine Learning, Computer Vision conferences (**CVPR, ICRA, AAAI**). Our papers are included as reading material in courses presented at well-known universities such as **UC Berkeley, CMU**. Developed state of the art deep learning models augmented with **spatial attention** and a **unique data augmentation technique** to control a robotic manipulator in both **benign** and **cluttered** environments using **learning from demonstration**. Implemented an interface to control the robotic manipulator with a PS4 controller and record demonstrations containing (image, command) pairs using ROS, C++, Python. Thesis title: **Task Focused Imitation Learning**
- **Technologies:** Python, Tensorflow, ROS, Chainer, C++

Composure.ai

Los Altos, CA

FULL STACK DEVELOPER - INTERN

Summer 2015 and 2016

- Implemented both **frontend** and **backend** of a real-time, responsive, and customized interface to interact with various **cloud components** such as instances, load balancers, security rules, etc. Implemented automation scripts in shell scripts for **docker, AWS** instances, and **OpenStack** instances. Implemented a graph visualizer with custom functionalities to visualize cloud components using **D3.js**
- **Technologies:** Java, HTML, CSS, Shell Scripts, Docker, OpenStack, AWS

University of Tehran Artificial Intelligence and Advanced Robotics laboratory

Tehran, Iran

BACHELOR STUDENT

2012 - 2014

- Implementation of an **Expert System** to Detect Autistic Children (**Bachelor Thesis**)
- **Technologies:** MATLAB, PHP, HTML, CSS, C++

Publications

Accept Synthetic Objects as Real: End-to-End Training of Attentive Deep

ICRA - Paris, France

Visuomotor Policies for Manipulation in Clutter

P. ABOLGHAEMI, L. BÖLÖNI

May 2020

- We proposed a data augmentation technique (Accept Synthetic Objects as Real) and two network models that take advantage of it to train end-to-end robot controllers which operate in the presence of clutter.
- Check out our YouTube Video: <https://youtu.be/GchuLQhG3ug>

Pay attention!-Robustifying a Deep Visuomotor Policy through Task-Focused Attention

CVPR - Long Beach, USA

P. ABOLGHAEMI, A. MAZAHERI, M. SHAH, L. BÖLÖNI

June 2019

- We proposed a technique for augmenting a deep visuomotor policy learned from demonstration with a task-focused attention model. The attention is guided by a natural language description of the task – it effectively tells the policy to “Pay Attention!” to the task and object at hand. we show that the proposed policy performs correctly in the presence of a wide class of visual disturbances, exhibiting a behavior reminiscent of human selective attention experiments.
- Check out our YouTube Video: <https://youtu.be/armz9CfjYRg>

Vision-Based Multi-Task Manipulation for Inexpensive Robots Using End-To-End Learning from Demonstration

ICRA - Brisbane, Australia

R. RAHMATIZADEH, P. ABOLGHAEMI, L. BÖLÖNI, S. LEVINE

May 2018

- We propose a technique for multi-task learning from demonstration that trains the controller of a low-cost robotic arm to accomplish several complex picking and placing tasks. The controller is a recurrent neural network using raw images as input and generating robot arm trajectories, with the parameters shared across the tasks.
- Checkout our YouTube playlist: <https://goo.gl/qkWAvs>
- Reading Material at CS294-112 Deep Reinforcement Learning course at UC Berkeley - <https://goo.gl/qz8KTt>

From virtual demonstration to real-world manipulation using LSTM and MDN

AAAI - New Orleans, USA

R. RAHMATIZADEH, P. ABOLGHAEMI, A. BEHAL, L. BÖLÖNI

Feb. 2018

- we designed an approach where the user demonstrates the task in a virtual environment. These virtual demonstrations are used to teach a deep neural network-based robot controller. Then, the controller is transferred to the physical robot.
- Checkout our YouTube playlist: <https://goo.gl/xER9dx>
- Reading Material at CS294-112 Deep Reinforcement Learning course at UC Berkeley - <https://goo.gl/BvnChM>
- Reading Material at Deep Reinforcement Learning and Control course at CMU: page 52 <https://goo.gl/XgrjC3>

Real-time placement of a wheelchair-mounted robotic arm

Ro-MAN - New York, USA

P. ABOLGHAEMI, R. RAHMATIZADEH, A. BEHAL, L. BÖLÖNI

Aug. 2016

- Introduced a metrics and method of how to estimate the best position for a wheelchair mounted arm to perform a manipulation

A Real-Time Technique for Positioning a Wheelchair-Mounted Robotic Arm for Household Manipulation Tasks

AAAI - Workshops - Phoenix, USA

P. ABOLGHAEMI, R. RAHMATIZADEH, A. BEHAL, L. BÖLÖNI

Feb. 2016

- Introduced a metrics and method of how to estimate the best position for a wheelchair mounted arm to perform a manipulation