Amir Arsalan Soltani

Website: amir-arsalan.github.io

(716) 535-7729 | aarsalansoltani@gmail.com   165 Cambridgepark Drive #327, Cambridge, MA 02140

SKILLS

AI and ML: Deep Learning, Graphical Models, Bayesian Optimization, Reinforcement Learning*
Technical: PyTorch, Blender, NVIDIA's FleX, TensorFlow*, Pybullet*, MuJoCo*   *some exposure

EDUCATION

State University of New York at Buffalo, *Buffalo, New York*   **December 2015**
Master of Science, Computer Science | *Concentration: Machine Learning*

Islamic Azad University, *Najafabab, Iran*   **May 2012**
Bachelor of Science, Computer Software Engineering
Awards: Ranked 19th in the nationwide entrance exam for B.Sc, Distinguished Student Award

WORK EXPERIENCE

Research Assistant, Massachusetts Institute of Technology, *Cambridge, MA*   **April 2016 - Present**
PI: Dr. Joshua Tenenbaum, Computational Cognitive Science Lab
- Physics-aware systems for perception and reasoning to endow AI agents with more human-like visual intelligence
  o Built a generative model for 3D shapes (github.com/Amir-Arsalan/Synthesize3DviaDepthOrSil)
    ▪ **First-author paper accepted to CVPR 2017**
  o Composing 3D shape priors with physics priors to recover 3D shapes draped under cloth
  o Giving the ability to imagine new physical scenes for physical commonsense reasoning given a text description
- Endowing robots with the ability to build accurate models of the environment and perform delicate interactions

Research Assistant, State University of New York at Buffalo, *Buffalo, NY*   **September - December 2015**
PI: Dr. Venu Govindaraju, Center for Unified Biometrics and Sensors
- Built an LDA-based model to do author name disambiguation for many departments at SUNY at Buffalo
- Modeled battery charging patterns for hundreds of mobile phone users with HMMs to predict optimal recharge time

Webpage Designer and Programmer, Saee Co, *Esfahan, Iran*   **July - October 2011**
- Worked on Esfahan WebGIS using JavaScript, C#, AJAX, HTML and OpenLayers

MANUSCRIPTS IN PREPARATION

Yildirim, I.**,** Siegel, M.*, **Soltani A**.**, Chaudhuri S.** & Tenenbaum J. "Perceiving Fully Occluded Objects via Physical Simulation"
* and ** indicate equal authorship

PUBLICATIONS

Soltani, A., Huang, H., Wu J., Kulkarni T. & Tenenbaum J. "Synthesizing 3D Shapes via Modeling Multi-View Depth Maps and Silhouettes with Deep Generative Networks", CVPR 2017.

INVITED TALKS

Vision Meets Cognition Workshop, CVPR, *Honolulu, HI*   **July 2017**
MIT Vision Seminar, Massachusetts Institute of Technology**,** *Cambridge, MA*   **October 2017**

REVIEWER EXPERIENCE

Reviewer, IEEE Conference on Computer Vision and Pattern Recognition (CVPR)   **2018**
Reviewer, Asian Conference on Computer Vision (ACCV)   **2018**

PROJECTS

Ongoing **- Commonsense Reasoning via Imagining New Physical Scenes (Python, PyTorch, Blender)**   **2018**
- Generate sequences of actions that give rise to a physical scene that explains the text description of a visual scene

Ongoing **- Building Touch Sensor in Simulation for Shape Perception (Python, PyTorch, Blender)**   **2018**
- Build a touch sensor in simulation to obtain physical properties of soft and rigid objects for delicate interaction

Compositional Perception System to Recover 3D Shapes (Python, Torch, PyTorch, Blender, FleX)   **2017-2018**
- Built a model-based, compositional perception system for recovering 3D shapes covered by cloth with low sample complexity

Modeling Multi-view Images to Build a Generative Model for 3D Shapes (Torch)   **2016-2017**
- Built a generative model for generic 3D shapes to obtain abstract description of objects to be used for model-building

Author Name Disambiguation using Latent Dirichlet Allocation (Python)   **2015**
- Used LDAs with online inference to assign scientific documents to their authors automatically.

Simulation of Discharge/Recharge Patterns for Mobile Device Users using HMMs (MATLAB)   **2015**
- Built HMMs with a Gaussian mixture model state transition to model recharge/discharge patterns for hundreds of mobile phone users and predict the optimal time for recharge

Improving Accuracy of Indoor Localization with Kalman Filter (R)   **2014**
- Implemented Kalman filters for localization
- Improved results described in the paper "Mapping organizational dynamics with body sensor networks" by 5-10%

Learning Bayesian Networks Structure using Decomposable Scoring Functions (MATLAB)   **2014**
- Developed a greedy method to learn Bayesian network structures using decomposable scoring functions(AIC, BIC)

Modeling and Inference Children Handwritings with Bayesian Networks (MATLAB)   **2014**
- Modeled a data set containing cursive and hand-printed hand writings of children attending elementary school, collected over two consecutive years with Bayesian networks
- Implemented exact and approximate (MCMC) methods for inference

DNA Nucleobase Sequence Modeling/Prediction using HMMs (MATLAB)   **2014**
- Implemented forward-backward, Viterbi and Baum-Welch algorithms to train a Hidden Markov Model (HMM)
- Modeled DNA nucleobase sequences to capture DNA regularities

Hand-Written Digit Recognition with Neural Networks (MATLAB)   **2013**
- Experimented with neural network on MNIST digits data set. Obtained accuracy of ~98.5%

Regression on Page Relevancy (MATLAB)   **2013**
- Experimented with regression models on LETOR 4.0 dataset using Gaussian basis functions

COMMUNITY SERVICE

Co-Founder, I Am Better, *Esfahan, Iran*   **July 2008 - July 2011**
- Founded an association in Iran to propagate good manners in driving among Iranian people

Science Teacher, Science is Elementary, *Buffalo, NY*   **July - December 2015**
- Taught science lessons and visualized abstract concepts to students at a local elementary school