Yilin Wu

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EDUCATION

Shanghai Jiao Tong University   *Sept. 2016 - Jun. 2020 (Expected)*

- B.S. in Information Security
- Accumulative GPA: **91.89/100**   Rank: **1/104**

University of California, Berkeley   *Jan. - May. 2016*

- International Exchange Student in Spring Semester
- Major GPA: **4.0/4.0**   Accumulative GPA: **4.0/4.0**

PUBLICATION

Yilin Wu *, Wilson Yan *, Thanard Kurutach, Lerrel Pinto, Pieter Abbeel, "Learning to Manipulate Deformable Objects without Demonstrations", under review for *IEEE Conference on Robotics and Automation*, Paris, France, Jun. 2020 [PDF][Website]

RESEARCH EXPERIENCE

Berkeley Artificial Intelligence Research Lab, UC Berkeley   *May. 2019 - Sep. 2019*

Research Assistant supervised by Prof. Pieter Abbeel

Learning to Manipulate Deformable Objects without Demonstrations

- Keywords: **robotics, reinforcement learning, deep learning**

Description

- The research aims to enable the robot to learn to manipulate deformable objects (e.g. rope and cloth) and we use special policy structure, named as pick-and-place policy, as well as some sim-to-real techniques to transfer the policy learned in the simulated environment to the real robot. Moreover, we are the first to use Reinforcement Learning without demonstrations to enable robots to manipulate deformable objects.

Contributions

- Proposed a novel learning algorithm for picking based on the maximal value of placing.
- Displayed the conditional action space formulation which significantly accelerates the learning of the deformable object manipulation.
- Demonstrated the transfer to real-robot cloth and rope manipulation.

Responsibilities

- Took main charge of building the simulated environment and running the experiments on GPU.
- Participated in the discussions on modifying the algorithms.
- Completed the research paper as the first author and submitted to the 2020 ICRA.

Apex Lab, Computer Vision Group, SJTU   *Apr. - Jan. 2018*

Research Assistant supervised by Prof. Yong Yu and Prof. Weinan Zhang

Improving upon VAE-related Models

- Keywords: **generative models, unsupervised learning**

Objective

- The research aims to solve the problem of blurriness in the VAE-related models and reach comparable image quality as GAN models We attempted to adjust the network structure based on Wasserstein Autoencoders (WAE) to increase the randomness by adding a noise to the input.

Responsibilities

- Gained in-depth understanding of generative models, especially Variational Autoencoder (VAE)and its variants, including the field of Variational Inference.
- Summarized the previous work on the topic by reading and analyzing the related materials about AAE, WAE, etc.
- Tried with more universal posteriors instead of the deterministic posterior or Gaussian posterior.
- Improved the algorithms of the original WAE, adjusted the parameters to run the tests, and observe the test results.
- Gave a brief talk on VAE-related models in the Apex Lab, including the analysis of improvement and shortcomings of VAE variants.

SELECTED COURSE PROJECTS

An End-to-End Encrypted File Sharing System [PDF][Code]   *Mar. 2019*

CS161 Computer Security   *UC Berkeley*

- Designed a file sharing system (e.g. Dropbox) that protects user privacy and add defenses to possible attacks using the knowledge of cryptography learned in class.
- Self-learned and mastered a new programming language Go for the project.
- Wrote a report summarizing the design and functions of the system and clarified the defense against potential major attacks in the system, which passing all the tests in the requirement.

Package Sender[Code]
Dec. 2018

IS301 Computer Communication and Network *Shanghai Jiao Tong University*

- Designed a package sender with a user-friendly GUI operated on Windows system.
- Composed TCP/IP/UDP packages based on information provided by users.
- Provided useful crypto tools, such as AES encryption, RSA encryption, RSA signature, SHA-256, and conversion from string to hex, to enhance the confidentiality and integrity of the message in packets.

Package Filter Firewall
Dec. 2018

IS304 Innovation of Science and Technology on Information Security *Shanghai Jiao Tong University*

- Configured the environment given the virtual network topology which consists of one main host and two virtual subnets.
- Designed firewalls and satisfied some routing rules using functionality of iptable.
- Successfully hid the intranet architecture and enabled ftp communications.

Compressing Files[Code]
Oct. 2018

IS205 Information Theory and Coding *Shanghai Jiao Tong University*

- Compacted different types of files such as .txt, .docx etc. with compaction algorithm like Huffman Coding and LZ Coding.
- Wrote a report to evaluate the efficiency of different algorithms and to compare the result among various types of files according to the data compression ratio and the compression speed.

Warning System to Reduce Risks of Opening the Car Door
Dec. 2016

ME116 Introduction to Engineering *Shanghai Jiao Tong University*

- Simulated the situation on a small car model with different kinds of transducers (e.g. infrared sensor, sound transducer).
- Using Arduino to control the signal response from different transducers and send warning messages.

SELECTED SCHOLARSHIP & HONORS

National Scholarship *(<1%)*	*2017*
Academic Excellence Scholarship (Second-Class) of SJTU	*2017,2018*
3rd Prize for Band C in National English Competition for College Students	*2017*
3rd Prize for SJTU Freshman Cup Orienteering Competition	*2016*

MISCELLANEOUS

Standard Test: TOEFL 115 *(Reading 30, Listening 29, Speaking 26, Writing 30)*; GRE 327+4.5 *(Verbal 157, Quantitative 170)*
Programming Skills: C/C++, Python, Matlab, Git, LaTeX
Scientific Computing: TensorFlow, PyTorch, Scipy & Numpy

EXTRACURRICULAR ACTIVITIES

Thailand Chiang Mai Volunteering Project
Jan 2018

- Taught English to Thai primary school students in Banpamuad School.

Shanghai International Marathon Volunteering Activity
Apr 2017

- Acted as the group leader to manage over 20 volunteers, arranging tasks including delivering suppliers and taking care of personal items for the participants.

International Communication Association
Nov 2016

- Organized the Orientation: Meet and Mingle and the Calligraphy Festival for international students.