Yang Yang

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Education

Doctor of Philosophy, Computer Science *Expected 05/2022*
University of Minnesota (UMN), Minneapolis
UMII-MnDRIVE Graduate Fellowship
Dissertation: Target-Driven Robotic Manipulation with Visual Attribute Reasoning
GPA: 3.94/4.0

Bachelor of Engineering, Energy and Power Engineering *2011 - 2015*
Huazhong University of Science and Technology (HUST), Wuhan, China
GPA: 91.4/100

Experience

Mitsubishi Electric Research Laboratories, Cambridge, MA *05/2020 - 08/2020*
Research Intern, Host: Dr. Siddarth Jain

- Developed deep reinforcement learning (RL) algorithms for contact-rich robotic manipulation
- Built a hierarchical RL-based policy of deep Q-learning (DQN) and soft actor-critic (SAC) models
- Applied a graph neural network (GNN) based visual state encoder

Google, Mountain View, CA *07/2018 - 08/2018*
Visual-Inertial System Engineer (contractor), Host: Dr. Stergios Roumeliotis

- Initiated a visual tracking and mapping (SLAM) system for Phone-based AR
- Wrote a C++ visual RANSAC library for camera pose estimation
- Implemented an image selection algorithm based on multiple RANSAC's

Selected Projects

One-Shot Target Object Detection

- Adapted Mask R-CNN to perform category-agnostic instance segmentation on RGB-D images; achieving 0.763 AP (Fine-tuned Mask R-CNN baseline: 0.385 AP)
- Implemented a Siamese Network trained with triplet loss for target template matching
- Visualized activation maps and t-SNE clustering for analysis

Referring Expression Comprehension and Generation

- Fine-tuned Visual-Linguistic BERT on RefCOCO dataset to localize a language-referred image region; achieving 0.874 accuracy (SOTA performance: 0.886)
- Trained a language generator to generate referring captions for the image region
- Experimented with different models (LSTM, GRU, and Transformer) for image captioning

Skills & Courses

Programming: **Python**, Matlab, C/C++, CMake, Linux, Bash, Git, SQL, Docker, LaTeX
Machine Learning: PyTorch, Tensorflow, Keras, scikit-learn, PyTorch Geometric, Ray, Spacy
Robotics: OpenCV, Open3D, PCL, ROS, Gym, MuJoCo, V-REP
Courses: Statistical and Deep Learning, Reinforcement Learning, Computer Vision, Natural Language Processing, Convex and Nonlinear Optimization, Operating Systems, Sensing and Estimation

Selected Publications

Yang Yang et al., "Attribute-Based Robotic Grasping with One-Grasp Adaptation", IEEE International Conference on Robotics and Automation (ICRA), 2021 [PDF, website]

Yang Yang et al., "A Deep Learning Approach to Grasping the Invisible", IEEE Robotics and Automation Letters (RA-L), 2020 [PDF, website, code]