Jianing(Aurora) Qian

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EDUCATION

University of Pennsylvania **Aug 2020 - Present**
Ph.D. in ***Computer Science***
Anticipated Graduation Date **May 2025**

Carnegie Mellon University **Aug 2014 - May 2020**
M.S. in ***Robotics***
B.S. in ***School of Computer Science****, Minor in* ***Robotics***
Selected Coursework: Statistical Techniques in Robotics (16-831), Deep Reinforcement Learning for Robotics (16-881), Kinematics, Dynamic Systems and Control (16-711)

PUBLICATIONS

J. Qian*, J. Shi*, J Ma*, D. Jayaraman. Pre-Trained Object-Centric Representations for Robotics Composed From "What" and "Where" Foundation Models, under review in *International Conference on Robotics and Automation (ICRA)*, 2024.

J. Qian, A. Panagopoulos, D. Jayaraman. SOFT: Recasting Generic Pre-trained Vision Transformers As Object-Centric Scene Encoders for Manipulation Policies, under review in *International Conference on Robotics and Automation (ICRA)*, 2024.

J. Qian, A. Panagopoulos, D. Jayaraman. Discovering Deformable Keypoint Pyramids, in *European Conference of Computer Vision (ECCV)*, 2022.

C. Wen, **J. Qian**, J.Lin, J. Teng, D. Jayaraman, Y. Gao. Fighting Fire with Fire: Avoiding DNN Shortcuts through Priming, in *International Coneference of Machine Learning* (*ICML)*, 2022.

J. Qian, D. Jayaraman. Object Representations Guided By Optical Flow, in *Neural Information Processing Systems (NeurIPS) Robot Learning Workshop*, 2021.

C. Wen*, J. Lin*, **J. Qian**, Y. Gao, D. Jayaraman. Keyframe-Focused Visual Imitation Learning, in *International Coneference of Machine Learning (ICML)*, 2021.

J. Qian*, T. Weng*, L. Zhang, B. Okorn, David Held. Cloth Region Segmentation for Robust Grasp Selection, in *International Conference on Intelligent Robots and Systems (IROS)*, 2020.

Y. He*, **J. Qian***, J. Wang, Depth-wise Decomposition for Accelerating Separable Convolutions in Efficient Convolutional Neural Networks, in *Conference on Computer Vision and Pattern Recognition (CVPR) workshop, Efficient Deep Learning for Computer Vision*, 2019.

N. Zevallos, A. Rangaprasad, H. Salman, L. Li, **J. Qian**, S. Saxena, M. Xu, K. Patath, H. Choset , A Real-time Augmented Reality Surgical System for Overlaying Stiffness Information. in *Robotics: Science and Systems (RSS)*, 2018.

N. Zevallos, A. Rangaprasad, H. Salman, L. Li, **J. Qian**, S. Saxena, M. Xu, K. Patath, H. Choset , A surgical system for automatic registration, stiffness mapping and dynamic image overlay, in *International Symposium on Medical Robotics (ISMR)*, 2018.

RESEARCH EXPERIENCE

UPenn General Robotics, Automation, Sensing, and Perception Lab **Aug 2020 – Present**
*Ph.D. Student, (Advisor: **Prof. Dinesh Jayaraman**, CIS, UPenn.)*

- Research on developing object-centric representation learning methods for robotics environment. Topics include unsupervised representation learning, imitation learning and reinforcement learning.

CMU Robotics Institute
M.S. in Robotics, (*Advisor: **Prof. David Held**, Robotics Institute, CMU*.) **Aug 2018 – May 2020**

- **Deformable Object Manipulation:** Designed cloth manipulation algorithm that automatically identify and estimate grasp location, direction and directional uncertainty based on depth images of cloths. Demonstrated the method on a real robot system and show that it outperforms baseline methods on grasping success.
- **One-shot Instance Tracking:** Designed a one-shot instance tracking framework that efficiently improves robustness and overall performance(EAO) of state-of-the-art trackers under challenging scenarios.
- **3D Depth Prediction:** Designed and implemented a deep multi-sensor fusion network for three-dimensional depth prediction that significantly outperforms monocular-image based depth prediction approaches

*Research Assistant, (Advisor: **Prof. Howie Choset**, Robotics Institute, CMU.)* **Aug 2015 – May 2018**

- **Automatic Tumor Detection (da Vinci research kit (dVRK)):** Developed a stiffness mapping program for a surgical system that is capable of autonomously searching for tumors.
  - **Finalist in the Best Symposium Paper Award for ISMR 2018**
  - **RSS 2018**
- **Vision-based Mobile Robot Localization in Confined Space:** Developed Particle-filter based robot localization algorithm to realize precise state estimation for a mobile assembling robot working inside a wing-bay. Developed robot simulation model to evaluate the robot localization performance.

PROFESSIONAL EXPERIENCE

Software Engineering Intern
Computer Vision and Machine Learning Group, Yahoo Research, San Francisco, United States
May 2017 - Aug 2017

- Created a framework to programmatically convert deep learning models from high-level research code into low-level executable models for mobile phones.
- Investigated the trade-off between model size, execution speed and model accuracy and revealed an important connection between the architecture of a network and its performance on the phone.

Software Engineering Intern
Qualcomm, San Diego, United States
May 2016 - Aug 2016
As part of the Graphics Test Development Team, built test strategy based on customer reports, developed API test coverage, and provided system level test coverage for GPU Software across different OS platforms

- Mainly worked on OpenGL ES 3.0, OpenGL ES 3.1, EGL
- Developed a stress test that test **EGL** multi-threading texture sharing

PROFESSIONAL SKILLS

Programming: Python, C/C++, Objective-C, Java
Library: PyTorch, Tensorflow, Keras, Core ML, OpenCV, BFL (The Bayesian Filtering Library), OpenGL ES 3.0/3.1
Software: The Robot Operating System (ROS), V-rep