QIHAO LIU

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EDUCATION

Johns Hopkins University (JHU) Baltimore, Maryland, USA
Ph.D. in Computer Science Aug. 2021 - Present
- **Advisor:** *Prof.* Alan Yuille

M.S.E. in Robotics Aug. 2019 - May 2021
- Perception and Cognitive Systems Track
- **Advisor:** *Prof.* Alan Yuille and *Prof.* Gregory Hager

Shanghai Jiao Tong University (SJTU) Shanghai, China
B.Eng. in Engineering Mechanics Sept. 2015 - Jun. 2019
- **Advisor:** *Prof.* Guoping Cai
- **Junior Major GPA**: 4.02/4.30 (91.30/100) **Rank**: 2/21

PUBLICATIONS

[8] **Qihao Liu,** Adam Kortylewski, and Alan Yuille. "PoseExaminer: Automated Testing of Out-of-Distribution Robustness in Human Pose and Shape Estimation." *under review*.

[7] **Qihao Liu*,** Junfeng Wu*, Yi Jiang, Xiang Bai, Alan Yuille, and Song Bai. "InstMove: Instance Motion for Object-centric Video Segmentation." *under review*. **(*equal contribution)**

[6] **Qihao Liu,** Yi Zhang, Song Bai, and Alan Yuille. "Explicit Occlusion Reasoning for Multi-person 3D Human Pose Estimation." *European Conference on Computer Vision (ECCV)*. 2022.

[5] Junfeng Wu***, Qihao Liu*,** Yi Jiang, Song Bai, Alan Yuille, and Xiang Bai. "In Defense of Online Models for Video Instance Segmentation." *European Conference on Computer Vision (ECCV)*. 2022. **(*equal contribution)**

[4] Qing Liu, Adam Kortylewski, Zhishuai Zhang, Zizhang Li, Mengqi Guo, **Qihao Liu**, Xiaoding Yuan, Jiteng Mu, Weichao Qiu, and Alan Yuille. "Learning Part Segmentation through Unsupervised Domain Adaptation from Synthetic Vehicles." *Computer Vision and Pattern Recognition Conference (CVPR)*. 2022.

[3] **Qihao Liu**, Weichao Qiu, Weiyao Wang, Gregory Hager, and Alan Yuille. "Nothing But Geometric Constraints: A Model-Free Method for Articulated Object Pose Estimation." *Arxiv Preprint*. 2021.

[2] **Qihao Liu**, Yujia Wang, and Xiaofeng Liu. "PNS: Population-Guided Novelty Search for Reinforcement Learning in Hard Exploration Environments." *International Conference on Intelligent Robots and Systems (IROS)*. 2021.

[1] Anran Wei, **Qihao Liu**, Haimin Yao, Ye Li, and Yinfeng Li. "Principles and Mechanisms of Strain-Dependent Thermal Conductivity of Polycrystalline Graphene with Varying Grain Sizes and Surface Hydrogenation." *The Journal of Physical Chemistry C*. 2018.

EXPERIENCE

Computational Cognition, Vision, and Learning Lab, JHU, Student Researcher Aug. 2021 - Present
Advisor: Prof. Alan Yuille
- Study image generation and manipulation methods for model robustness and authenticity;
- Proposed an automated testing method to diagnose human mesh reconstruction models, especially out-of-distribution robustness, and significantly improved robustness and performance on standard benchmarks *(submitted to CVPR23)*.

ByteDance AI, Research Intern May. 2021 - Mar. 2022
Mentor: Dr. Song Bai
- Proposed a 3D Human Pose Estimation method for complex scenarios;
- Proposed an online video instance segmentation method, achieved state-of-the-art performance on three standard benchmarks, and won first place in the Video Instance Segmentation Track of the 4th Large-scale Video Object Segmentation Challenge in the CVPR2022 workshop.

Computational Cognition, Vision, and Learning Lab, JHU, Visiting Researcher May. 2020 - Dec. 2020
Advisor: Prof. Alan Yuille, Prof. Gregory Hager
- Proposed an unsupervised method to estimate articulated object pose and robot arm pose without knowing the model or category information a priori, it only needs a sequence of RGB or RGB-D single-view images as input;
- Built a synthetic dataset with different kinds of robots and multi-joint articulated objects.

SJTU Robot Dynamics and Control Lab, Student Researcher Sept. 2018 - Jun. 2019
Advisor: Prof. Guoping Cai, Dr. Xiaofeng Liu
- Proposed Population-guided Novelty Search (PNS) for Deep Reinforcement Learning-based control, introduced sub-population and NS in DRL to promote directed exploration and avoid local optima in hard exploration environments;
- Used PNS-A2C to control UR5 for vision-based robot manipulation tasks with sparse reward signals.

HONORS & AWARDS

1. **1st place in the Video Instance Segmentation Track of the 4th Large-scale Video Object Segmentation Challenge (CVPR2022)** ***(For "In Defense of Online Models for Video Instance Segmentation.")*** 2022
2. **Provincial 2nd Prize, Chinese Mathematical Contest in Modeling** (CUMCM) (top 10% in China) 2018
3. **Scholarship for Excellent Academic Performance** (top 10% in STJU) 2017, 2018
4. **Cyrus Tang Scholarship** (80 students in STJU) 2016