

PEIQI YU

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EDUCATION

Tsinghua University

2019 - 2023

B.E. in Automation

GPA: 3.81/4.0 *Mentor:* Chao Shang

Major Courses: Fundamentals of Artificial Intelligence, Control Theory, Stochastic Process, Signal and System, Digital Image Processing, Numerical Analysis, Statistics, Data Structure

WORK EXPERIENCES

Short Term Scholar

2023

Intelligent Control Lab, Carnegie Mellon University(CMU)

Advisor: Prof.Changliu Liu

Research Intern

2022-2023

Learning & Neural Systems Group, Tsinghua University(THU)

Co-advisor: Prof.Yilin Mo & Prof.Yanan Sui

Research Intern

2021-2022

Information Processing Institute, Tsinghua University(THU)

Advisor: Prof.Jiwen Lu

PUBLICATIONS

Recovering Realistic Details for Magnification Arbitrary Image Super-Resolution

2022

IEEE Transactions on Image Processing

Cheng Ma, Peiqi Yu, Jiwen Lu and Jie Zhou

- * Proposed Implicit Pixel Flow (IPF) to bridge the gap between blurry INR distribution and sharp real-world distribution by assigning pixel-coordinate offsets near blurry edges.
- * Proposed feature aggregation module that aggregates the nearest flow representation vectors to utilize both changes in neighbouring features and semantic information, thereby avoiding block effects.
- * Introduced double constraint strategy and confidence map, ensuring the stability of performances.
- * The first successful method for recovering perceptually-pleasant details in single image super-resolution, outperforming SOTA models.

WORKING PAPERS

Hierarchical Intention-Driven Human-Robot Interaction through Planning Prediction

2023

Manuscript in Preparation

Peiqi Yu, Abulikemu Abuduweili, Ruixuan Liu and Changliu Liu

- * Introduced a framework that enables hierarchical human detection through distance estimation and hierarchical human intention recognition via planning prediction.
- * Proposed hierarchical human detection through distance estimation, eliminating potential interferences to enhance the precision of low-level human intention recognition.
- * Proposed hierarchical human intention recognition, decomposing high-level intentions into a series of sub-tasks, facilitating planning prediction based on low-level intentions.
- * Largely promote human robot collaboration efficiency by introducing hierarchy, resulting in more robust, more convenient and more intuitive human-robot interactions.

SELECTED RESEARCH EXPERIENCES

Transformer-based Bayesian Optimization

2022 - 2023

Bachelor's Project, Tsinghua University

Supervisors: Professor Yilin Mo, Department of Automation, Tsinghua University

Professor Yanan Sui, School of Aerospace Engineering, Tsinghua University

- * Proposed using Transformer for Bayesian Optimization(BO) due to its alignment with the sequence decision-making characteristics of Bayesian optimization.
- * Deducted mathematical analysis of BO and embedded translation and rotation invariance, as well as input equivariance into the Transformer network.
- * Demonstrated an impressive 80% performance improvement compared to state-of-the-art (SOTA) models in few-shot learning.
- * Combined the applicability of BO with the high-dimensional scalability of Transformer, enhancing the robustness and adaptability, can potentially be applied in continuous learning and online learning.

Learning From the Wild: Imitation Learning From Real Life Demonstrations

2022

Module Developer, Tsinghua University

Supervisors: Professor Dorsa Sadigh, Department of Computer Science, Stanford University

Professor Yanan Sui, School of Aerospace Engineering, Tsinghua University

- * Designed a Reinforcement Learning(RL) framework enabling robots to observe real-life videos, perform actions, and learn human actions through action imitation.
- * Introduced domain adaptation to align robot and human actions during training, resulting in improved performance and generalization.
- * Enhanced the robustness of the RL framework by incorporating optical flow to extract human actions, leading to more effective and precise learning outcomes.

Wearable Sensor Data-Based Intelligent Sleep Stage Detection

2021

Core Algorithm Developer, Beijing Academy of Blockchain and Edge Computing

Supervisor: Tianyu Feng, Beijing Academy of Blockchain and Edge Computing

- * Developed precise sleep-staging algorithms using Support Vector Machines (SVM), Random Forest, and Neural Networks, achieving a classification precision rate within a 5-minute window.
- * Proficiently managed a MySQL database, overseeing the storage and retrieval of critical data, including heart rate, temperature, and motion signals.

ACHIEVEMENTS

Academic excellence award	2020
Huang Yicong scholarship	
Science&technology excellence Award	2021
School Management scholarship	
Academic excellence award	2022
National Inspirational Scholarship	

TECHNICAL SKILLS

Languages	Python, C++, C, Matlab, L ^A T _E X
Libraries	PyTorch, RosPy, Numpy Matplotlib, Sci-kit, GPytorch
Hardware	Kinova, Raspberry Pi
Software Systems	Mujoco, ROS, Openai-Gym, MySQL Ubuntu, Windows

Please visit my homepage for more information: <https://patricia1019.github.io>