PEIQI YU

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EDUCATION

Tsinghua University 2019 - 2023
B.E. in Automation
GPA: 3.81/4.0 *Mentor*: Chao Shang, Associate Professor
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 Univeristy**(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 avoding 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 Human-Robot Collaboration Through Intention-based Adaptive 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, combining speech command and pose 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 supporting multi-model inputs and introducing hierarchicy, resulting in more robust, convenient and 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 sequential 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, LaTeX
Libraries PyTorch, RosPy, Numpy
Matplotlib,Sci-kit,GPytorch
Hardware Kinova, Raspberry Pi
Software Mujuco, ROS, Openai-Gym, MySQL
Systems Ubuntu,Windows

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

https://github.com/Patricia1019
https://scholar.google.com/citations?user=f$_l$K1RYAAAAJ9