

Xie Yuhan

Portfolio: github.com/XYHZJU

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Education

- **Zhejiang University** Hangzhou, China
Bachelor of Automation; GPA: 3.88/4.0 *September 2019 - June 2023*
Main Courses: Calculus, Linear Algebra, Complex Variable Functions, Imbedded System, Program Design, Principle of Automatic Control, Artificial intelligence, Computer Vision
- **KTH Royal Institute of Technology** Stockholm, Sweden
Master of System, Control and Robotics; GPA: 4.63/5.0 *September 2022 - June 2024*
Main Courses: Introduction to Robotics, Modelling of Dynamic Systems, Computer Vision and Image Analysis, Machine Learning, Artificial Intelligence and Multi Agent Systems
- **EPFL** Lausanne, Switzerland
Exchange Student; GPA: 5.75/6.0 *September 2023 - present*
Main Courses: Intelligent Agents, Mathematics of data: from theory to computation, Semester Project

Skills Summary

- **Programming Languages:** Python, C, C++, C#, Matlab, Lua
- **Frameworks:** Pytorch, ROS, OpenCV
- **Domains of Interests:** Deep Learning in Time Series, Transfer Learning, Graph Learning, Multi-agent Decision

Academic Experience

- **ZJUNlict RoboCup Laboratory, Zhejiang University** *September 2021 - July 2022*
Lab student member
 - **State Machine on 8vs8 Football Game:** Use Lua to maintain the state machine of the game and decide the offensive or defensive strategy based on visual parameters.
 - **Intelligent Decision Making:** Developed value based evaluation function to calculate the best receiving position for players, and the best passing targets.
- **State Key Laboratory of Industrial Control Technology, Zhejiang University** *June 2022 - December 2023*
Lab student member
 - **Multi-step Prediction of Industrial Process by Deep Learning:** Developed a Decomposition-based Encoder-Decoder Framework for Multi-step Prediction of Burn-Through Point in Sintering Process. A conference paper is published based on the work, and one Journal paper is being prepared based on the extension of the work.
 - **Forecasting on Time Series with Temporal Distribution Shifts:** Proposed decorrelated domain adversarial training (DDAT) on datasets are shown to suffer from distribution shifts over time, with outperforming results. The work is submitted to one journal.
- **Signal Processing Laboratory (LTS4) , EPFL** *September 2023 - present*
Project Student
 - **Graph Representation Learning for Epilepsy Classification:** Leveraged current advancements in graph learning for time series forecasting to extract task-specific networks in the self-supervised pretraining strategy, and studied the performances of graph learning networks at different scale, by comparing static and dynamic networks, as well as personalized ones, to achieve better performance.
 - **Task Alignment of Self-Supervised Learning in Time Series:** Designed auxiliary tasks and self-supervised learning structures to achieve better performances of downstream tasks. Adopted the idea of contrastive learning and auxiliary variable embedding to formulate a better optimization process and latent distribution in the self-supervised learning task, which in the end provides more transferable embeddings.

Publication

- **A Decomposition-based Encoder-Decoder Framework for Multi-step Prediction of Burn-Through Point in Sintering Process:** First author, 2023 IEEE 6th International Conference on Industrial Cyber-Physical Systems (ICPS) (Accepted)
- **Learning Self-Supervised Dynamic Networks For Seizure Analysis:** Co-first author, ICLR 2024 workshop (Accepted)
- **EnvFormer: A Decomposition-based Encoder-decoder models for Burn-through Points Multistep Prediction:** First author, IEEE Transactions on Industrial Electronics (Under Review)
- **Decorrelated Domain Adversarial Training for Time Series Forecasting with Temporal Distribution Shifts:** Co-first author (In Submission)

Projects

- **Path and Trajectory Planning:** Project of the Course Smart Mobile Technology. In the given simulation environment of a 90 square meters football field, I combined RRT* route plan method with PID control method to enable vehicle moving up to 3m/s to the target and avoid dynamic obstacles. (November '21)
- **Bouncing Ball System by Arduino:** Use camera, Arduino and servos to build a close-loop system to bounce the ball on a plate. Use Camshift and Hough Circle Transformation to recognize the ball and fuzzy PID method to control the four servos. (December '21)
- **Traffic Flow Prediction by LSTM:** Use LSTM to predict the transit time of buses in a district. I obtained 22 bus routes and their timestamps, and made time-series predictions of bus speeds through deep learning methods. (May '22)
- **Pedestrian Tracking by Kalman filter and Particle Filter:** We implemented Kalman filter and Particle filter to track a given pedestrian from a video clip of MOTChallenge data set. We improved the particle filter to solve the problem of losing target when two pedestrians overlap. (December '22)
- **Multi-intelligence Collaborative Search:** In the simulate environment built by Unity, we developed an algorithm to generate optimum paths for three cars to search a random maze. (March '23)
- **Decentralized Coordination:** Implemented an auctioning agent for the pickup and delivery problem to achieve optimal individual pay off. (November '23)

Honors and Awards

- KTH One-Year Scholarship (top 11 out of 1000+) - April, 2023
- Outstanding Graduate Students of ZJU (top 30 out of 150) - June, 2023
- Second-class Scholarship of ZJU (top 30 out of 150) - October, 2021
- Third Prize of The Chinese Mathematics Competitions - December, 2021

Other Experience

- Chair Man of the College Student Union, June 2021 - June 2022
- Coach of the School Debate Organization, September 2020 - June 2021
- Member of Zhejiang University Student Committee, June 2021 - June 2022