

Jiahe Xu

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EDUCATIONAL BACKGROUND:

- **Johns Hopkins University** 08/2020 – 05/2022(*expected*)
Whiting School of Engineering, Robotics MSE
Cumulative GPA: 3.7/4
- **Jilin University** 09/2016 - 07/2020
Tang Ao-qing Honors Program in Computer Science
Cumulative GPA: 89/100 3.6/4
- **Massachusetts Institute of Technology** 08/2019
2019MIT Machine Learning & Artificial Intelligence Short Course
Course Grade: 91.5/100

Github: <https://github.com/JiaheXu>

CSDN: https://blog.csdn.net/EOD_realize

(A blog of code notebook back to high school, the click number is over 200K)

Professional Skills:

Programming Languages: C/C++, Java, Javascript, Python, Matlab, PHP, VHDL, Julia.

ROS experience: Familiar with ROS, learned ROS through course works and official tutorials

Research Experiences:

Research on Unmanned Aerial Vehicle

Research Assistant Dept. of ME, JHU ASCO Lab Director: Prof. Marin Kobilarov 09/2021-now

- Created an interactive visualization framework of debugging, optimizing, and state-checking. Implemented a GUI to represent the state of UAV(PX4) with Qt and QcustomPlot package.
- Took part in constructing the simulation environment.

Research on Intelligent Wind Power Generator (WPG)

Research Assistant Dept. of CS, Jilin University Director: Prof. Lan Huang 09/2020-06/2021

- Used an RNN model to predict the wind speed and direction with historical data.
- Applied an MPC controller to adjust the direction of fans (so it could generate more power).
- Designed a local search method for cooperation between WPGs (WPGs on the front will influence wind speed and direction to WPGs on the back)

Research on Facial Expression Recognition

Research Assistant Dept. of EE, Tsinghua University Director: Prof. Yi Yang 07/2019-09/2019

- Researched two CNN models for realizing facial expression recognition (Resnet and Facenet).
- Analyzed algorithms of two methods and summarized the advantages and disadvantages.
- Adjusted dataset to improve models' performances, tested model robustness with different data distributions.
- Improved about 10% accuracy (from 72.3% to 81.9%) on expression recognition.

Core courses (Control and machine learning related):

JHU: Nonlinear Control and Planning in Robotics, Applied Optimal Control, Computer Vision, Nonlinear Optimization I & II, Machine Learning: Learning theory, Deep learning,

UC Berkeley: Linear System Theory, Introduction to statistical learning, Deep Reinforcement Learning, Integrated Perception Learning, and Control

Teaching experience:

Jilin University EECS department

09/2020 – 06/2021

Teaching Assistant of course "Data structure" 2020 Fall.

Teaching Assistant of course "Algorithm Analysis" 2021 Spring.

Projects

Planning and Control of a Quadrotor

- Simulated quadrotor planning and control in an indoor environment with obstacles.
- Used a short path algorithm to find an initial path (waypoints) and refine the path with the cross-entropy method.
- Applied spline functions to connect waypoints with a minimum jerk.

Camera Imaging Characteristics-based Data Augmentation for Deep Learning

- Implemented camera imaging characteristic-based method to determine camera functions of different cameras.
- Employed different camera functions to enlarge the dataset.
- Tested different deep learning tasks such as classification, segmentation, and object detection with the new data augmentation method.
- Had better improvements on performances on segmentation and object detection tasks.

Surgical Assistant Workstation

- Developed a method calibrating the surgical tool's tip position in the EM tracker's frame.
- Applied Iterative Closest Point method to do registration to determine surgical tool's relative position to bones
- Made a GUI to represent all the valuable information during operations.

Pacman with Reinforcement learning

- Conducted the Pacman game from scratch with python.
- Implemented a Double-DQN reinforcement learning method trained AI player.
- Designed a local search algorithm to make four ghosts trap the AI player with high efficiency.

Move-and-Place with UR5

- Controlled the UR5 model in ROS with MATLAB interface.
- Achieved the move and place objects task with UR5 with three different control methods:
IK control, Resolved-rate control and Transpose-Jacobian control

Intelligent Energy Saving Lamp System

- Designed and implemented an intelligent energy-saving lamp system with a RaspberryPI as the controller.
- Connected the RaspberryPI to a web server, enabling the administrator to control the lamp online.
- Used motion detection camera and CNN to determine when to turn on and turn off the lamp automatically.