Bachelor Thesis: Relevant Work Experience

Software: Python, C/C++, MATLAB; ROS, Git, OpenCV, PCL; SolidWorks, LabVIEW.


Relevant Projects


Computer Vision, Pattern Recognition, Prototyping MATLAB; Raspberry Pi

Proposed and developed the first wearable wrist camera sensor for recognizing hand trajectory gestures with applications for human-computer/robot interaction in smart home. The paper of this work has been accepted by IEEE Sensors Journal.

- Estimated the hand velocity by extracting and matching SURF features from the background of image.
- Adopted Lazy Snapping (GrabCut) to segment hand region for detecting hand wrist flexion/extension.
- Implemented Dynamic Time Warping for measuring a sample's distances to the training set, and used KNN for classification

Control Robot Arm by Using Finger Gestures and Wrist Camera, Zhejiang University Oct. 2017-Jan. 2018

Computer Vision, Robot Arm Motion Control MATLAB; Raspberry Pi

Developed a wrist-worn camera sensor and the corresponding algorithm to recognize fingers types (gestures) in the image.

- CV: Utilized color and shape to detect fingers. Proposed a feature-based method to classify fingers based on one template.
- Control: Mapped finger gestures and implemented resolved-rate motion control to operate a robot arm to transport blocks.

Wheeled Robot Navigating in a Maze, Zhejiang University July 2016

Path Planning, Control MATLAB, LabVIEW; NI Starter Kit Robot

Programmed a robot car to move in a maze and drive to the target position. The map was already given. Responsible for following:

- Path Planning: A* algorithm, with the cost function modified to incorporate "distance to obstacles" to ensure security.
- Control: Used PID to drive the car to the next target pose of \((x^*, y^*, \theta^*)\). When getting close, update target.

Classification of Handwritten Numbers, Zhejiang University July 2015

Computer Vision, Machine Learning, Deep Learning C

- Tested performance of NN, CNN, Autoencoder, kNN for classifying MNIST handwritten numbers on MATLAB.
- Transferred the trained parameters of the K-means+SVM method to C, and wrote a program with GUI to recognize numbers.