



JOINT INSTITUTE  
交大密西根学院

## Feature point detection of calibration board for ADAS camera calibration

### Sponsor:

- Company Sponsor: Huajun Guan, HASCO VISION
- Company Mentor: Jianning Yu, HASCO VISION



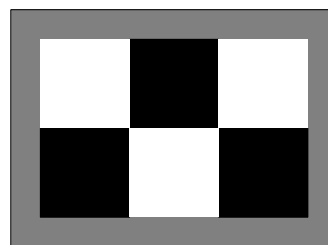
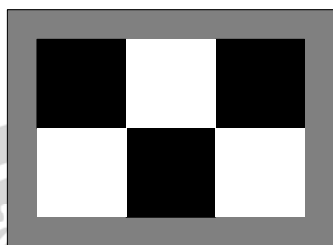
### Background:

Collaboration between UM-SJTU Joint Institute and HASCO VISION Technology Co., Ltd.

- HASCO VISION proactively joined this program. HASCO VISION will assign dedicate engineer as a mentor.
- Students need to discussion with mentor on the tasks and deliverables and need to work as planning until deliver the project deliverables.

Camera extrinsic parameter calibration is the basis of ADAS distance estimation. Usually, calibration board with fixed pattern is used for camera calibration. Feature point of the calibration board is the first step and also the most important step. However, it is hard to detect the feature point accurately in different light conditions and complex background.

Below is a sample of calibration board. The RGB of the black is [0, 0, 0], the white is [255, 255, 255] and the grey is [128, 128, 128]. The square size is a custom value, the width of the grey border is 1/4 of the square width.



### Purpose:

1. Detect all the corner points in the board except the four outermost points.
2. The detection accuracy is 0.1pixels.
3. Test the detection Algorithm in different light condition and complex background (guarantee the robustness).
4. Test the detection Algorithm in the condition of the left and right board with various relative positions.

### Expected Deliverables:

- Deliver the Algorithm model.
- Deliver the program base on Linux.
- Deliver the test report.

**Team:** Students with the following skills are encouraged to apply:

- Basic understanding of image/pattern recognition
- Familiar with Linux developing environment
- Master C/C++ programming.

### Benefit to Students

- Learn real project development before really go outside of university and entering your career path.
- Get In-depth knowledge on Image Recognition, test, automation, etc.