

# 25<sup>th</sup> IPP: Research on intelligent detection algorithm based on camera calibration and object recognition

**PROJECT SUMMARY:** Safety management and maintenance are essential in state grid operation. However, currently, some related tasks are still conducted manually and personally, which is highly inefficient and could be inaccurate due to human carelessness or negligence. For example, the anchor bolts and their main column may not be concentric, which is currently inspected by manual measurement. Our goal is to make the inspection procedure automatic by utilizing computer vision. If the whole safety inspection can be performed automatically, the safety management can be more efficient and accurate.

**POSSIBLE DUTIES & RESPONSIBILITIES:** This project mainly involves the algorithm optimization of camera calibration and object recognition. In addition, it also involves hands-on experiments, mainly for building a model and taking pictures. Documentation of research slides and summary is also needed.

## **PREFERRED QUALIFICATIONS:**

- JI junior/sophomore students (or SJTU students with a related major)
- Self-motivated with interests in computer vision, image processing, and/or hands-on experiments
- Experience in Python and Matlab or similar software
- Experience in image and signal processing
- Work independently to some extent
- Prior research experience desired, but not required
- Basic knowledge of computer vision is a plus

**Instructor's support for the project:** Regular meetings are arranged once a week to let the students report the research progress, the problems encountered, and the future action items. The instructor will actively participate in the discussion during weekly meetings.

**Expectation and students' outcomes:** After conducting the project, students can have a deeper understanding of independent research and develop their critical thinking and problem-solving skills. It would be better that the students are self-motivated, curious about unknown things, and have a passion for computer vision to some extent.

**Application:** All interested applicants are encouraged to contact Dr. Sung-Liang Chen at [sungliang.chen@sjtu.edu.cn](mailto:sungliang.chen@sjtu.edu.cn).