I am the team lead and a computer vision engineer of a robotics competition team with 30 members. I am responsible for developing auto aiming feature for the shooting system on mobile robots to accurately shoot the target. My task was to release a feasible version before the competition in 3 weeks. The feature could be divided into detection part and the tracking part, the input of tracking depends on the output of detection. While several effective solutions existed tracking, the detection was a challenge for me as it could be best solved using deep learning methods but the fine-tuning workflow was inevitable, which was unfamiliar to me when I was just a sophomore.

After extensive research during the first three days, I decided to balance technical difficulty, benefits, and time constraints by opting for a more accessible solution using OpenCV, which is a traditional image processing method. I successfully implemented the detection within 1 week. Although the accuracy was not ideal, it was functional. In the final week before the competition, I integrated the detection and tracking, making the algorithm feasible for deployment on the robot.

As a result, we are the only 8% teams demonstrating this feature on the field, securing us the 3rd place in the tournament. The algorithm is simple but effective, providing solid foundation for future optimization.