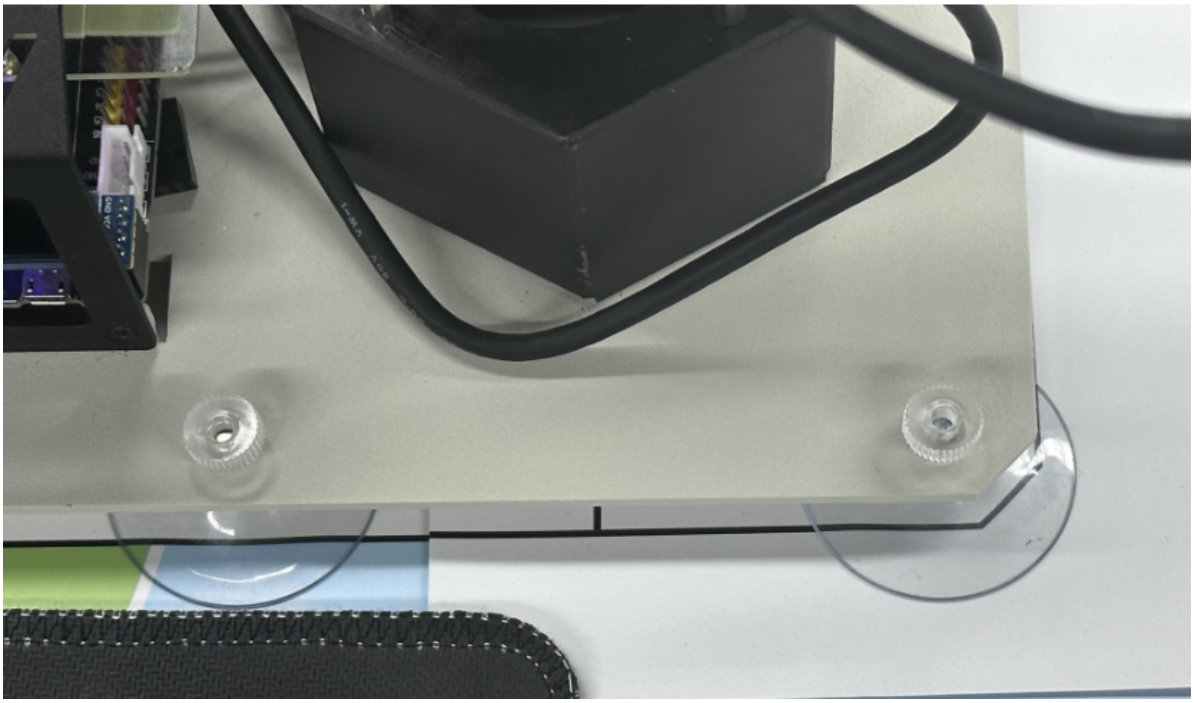
Calibration Offset

Due to minor errors in the servos on the robotic arm from the factory, the gripper's landing point will be slightly forward/backward when the arm is grasping objects. Therefore, an offset needs to be added to compensate for these errors.

1. Fix the Calibration Board

Fix the calibration board we provide on the map, as shown in the figure below. The robotic arm base needs to be within the calibration frame.

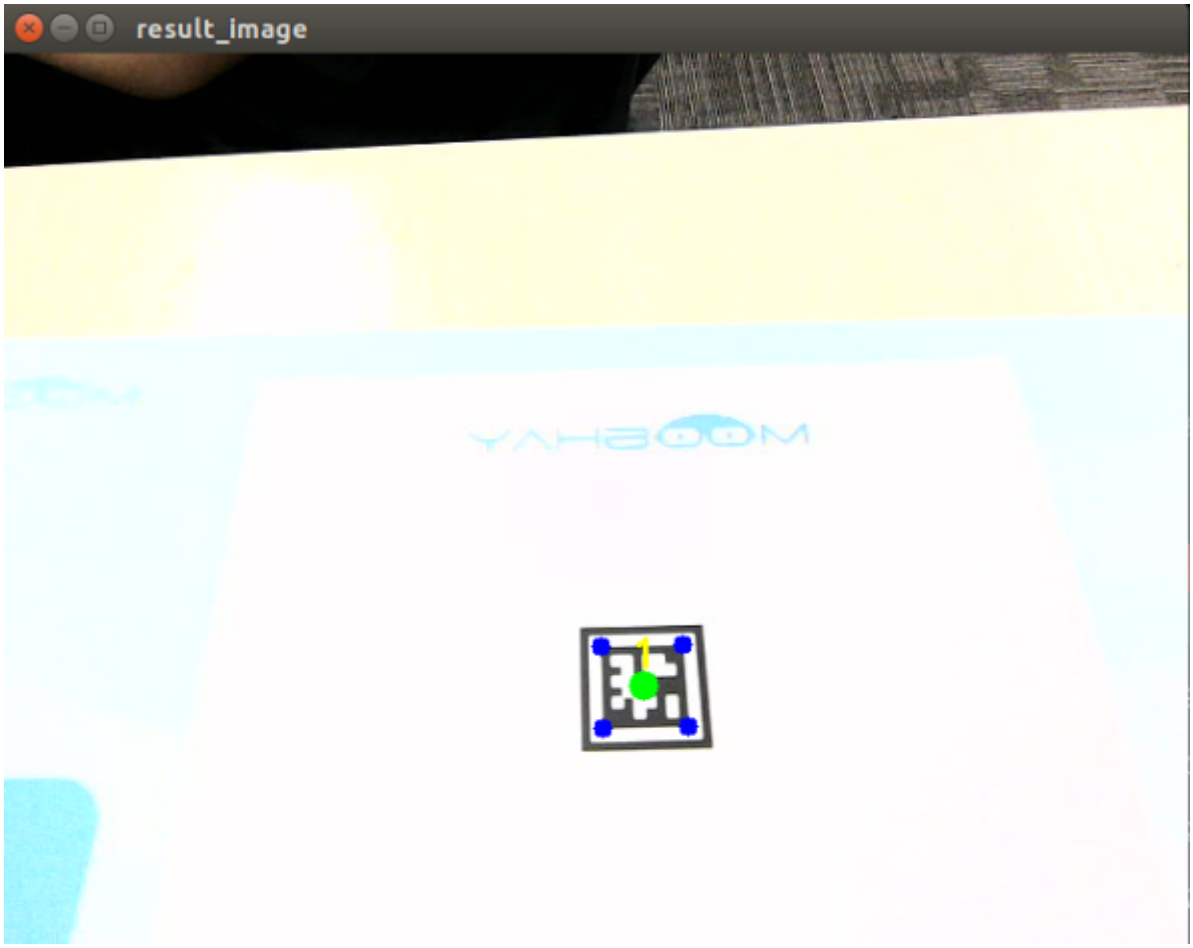


2. Run the Program

Enter in the terminal:

```
ros2 launch orbbec_camera dabai_dcw2.launch.py
ros2 run dofbot_pro_driver arm_driver
ros2 run dofbot_pro_info kinemarics_dofbot
ros2 run dofbot_pro_apriltag calibrate_offset
ros2 run dofbot_pro_driver apriltag_detect
```

As shown in the figure below, after the program runs, the machine code on the calibration board will appear in the image:



Press the spacebar, and the program will calculate the position (xyz) of the machine code on the calibration board in the world coordinate system, then perform calculations with the corresponding position of the machine code on the actual calibration board in the robotic arm base coordinate system (0, 0.181, -0.01), and save the calculation results in the offset parameter file. The offset parameter file is located at:

```
/home/jetson/dofbot_pro_ws/src/dofbot_pro_driver/config/offset_value.yaml
```

The content of the offset parameter file is as follows:

```
x_offset: 0.0
y_offset: 0.01164
z_offset: -0.0092
```

At this point, the calibration program is complete, and subsequent programs will automatically load the values from the offset parameter file.