

Application of ET sensor

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Abstract- This paper will be devoted to a better use of ET distance sensor, we will show advantages and disadvantages of this sensor and also how distance sensors are used in everyday life.

Keywords—robot, sensors, distance measurement, reference point method.

I. INTRODUCTION

Sensors are an important part of every robot. They allow to improve its operation and repeatability of activities. Without them, precise actions would not be possible. Unfortunately, unskillfully use of sensors can reduce the robot's efficiency. The sensor that we would like to discuss is the ET sensor used by many teams. But is it used correctly?

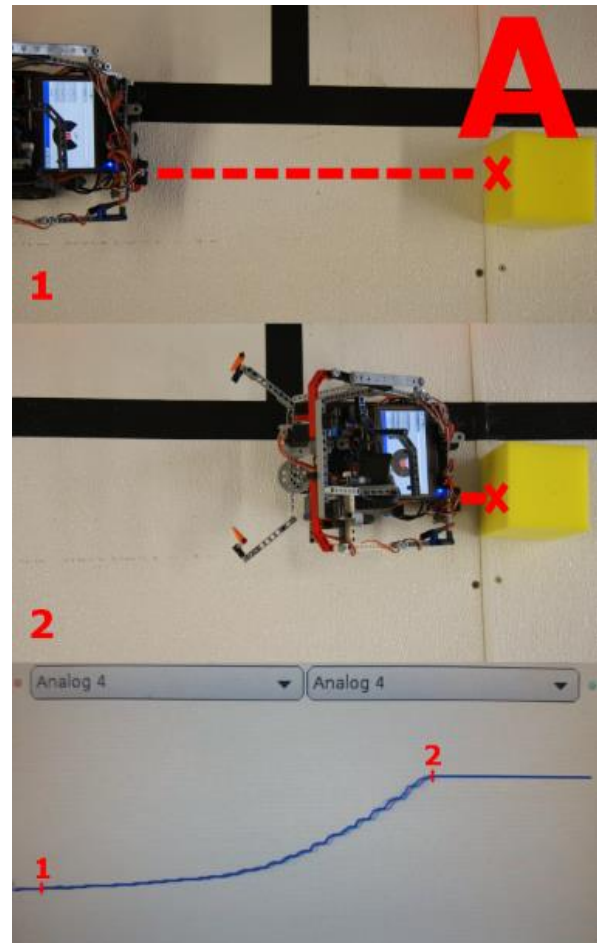
II. CONCEPT

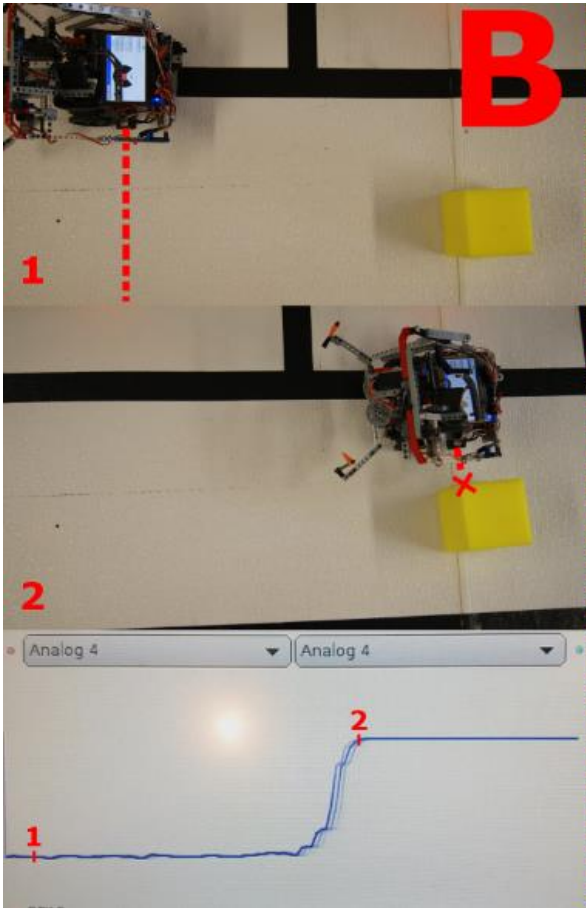
Distance sensor is a great sensor if we know how to use it. As we noticed the sensor is inaccurate in some situations. We can prevent problems when we design configurations which allow the robot to move around the table using the reference points method. In this method calibration and positioning at table is determined by recognition parts of the board such as PVC pipes etc. Significant differences between readings allow to analyze data faster and easier and make our robot dependable.

This method gives us new opportunities and at certain times allows us to save valuable seconds.

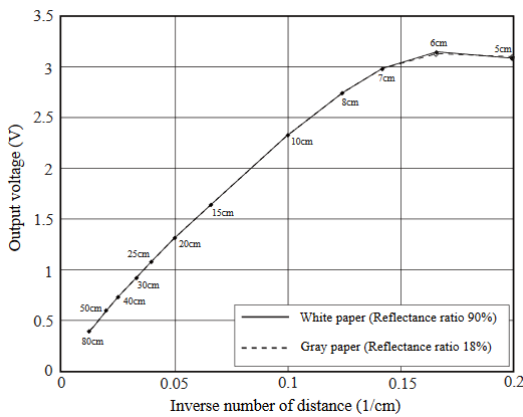
III. EXPERIMENT

We've conducted a simple experiment. The robot's task was to get to the yellow cube. Robot A used the ET sensor to measure the distance to the cube and Robot B used the reference point method. As you can see at the illustration below, the difference between the initial and final reading it is much easier to detect by robot B. Accurate data analysis prevent many other errors in time of robot mission.





Another problem shown in this experiment are the values read by this sensor at distances of less than 10 cm. As presented in the chart below the robot may have a problem with noticing the difference between the distances of 5 and 7, which causes the robot to go too far or too close.

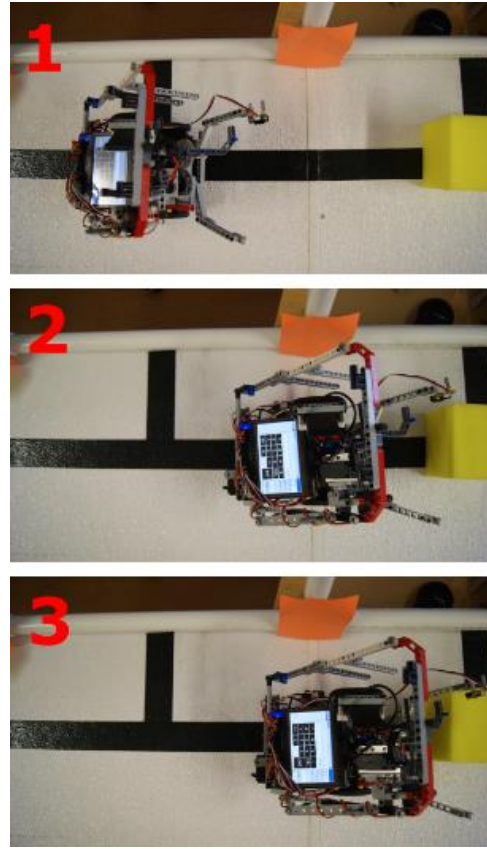


Robot A had to drive slower to make the measurements more accurate and to prevent errors.

IV. APPLICATION

This solution for the Botball participants can be very useful, but we have to remember that it is a method that will not work in every situation. You will often

need to use an additional sensor by yourself. We do not always come across such situations as in our experiment. In most cases, the robot will also have to use a touch sensor. An example of use will be presented in the example below.



The robot's task is to catch cube. In the first phase, the robot drives until the detection of the pvc pipe. After the pipe has been detected, the robot starts to ride along, slower, until it detects the cube using a Top Hat sensor.

V. CONCLUSION

The reference point method using the ET sensor is very effective and it gives us a great accuracy in combination with other sensors. But keep in mind that even the best method misused can worsen your situation.