# TROID- the TRacking Android

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### The Smartphone capabilities







Yes , the affordable simple android phone can do it all .

## **Project Description**

- Perform real time tracking using android smartphone.
- The target is red colored paper, it is distinguished solely by its color.
- The Smartphone controls a Rover5 robot using the microcontroller IOIO board The brain (the phone)

The target

The Rover's Robot





## **Color Detection**

#### **RGB color space**

• Every color is represented by combination of Red, Green and Blue.



#### **HSV color space**

• Every color is by its hue, saturation level and value (brightness).



# **Color Segmentation**







# **Object Detection**





### **Distance and Direction**

- Distance is determined by the percentage the object takes from the frame.
- Direction is determined by the average X coordinate of the object.



## Controlling the robot

• The microcontroller which is the IOIO board is the one responsible to supply the voltage to move the motors and supply the logic to determine its direction. this is done using 6 pins:

- 1. 2 pins are PWM (pulse width modulation) signals, each one is responsible for moving one side of the robots motors in certain speed determined by the pulse width.
- 4 pins are digital signals, which is responsible for the logic to determine the robot direction { forward , backward , Clockwise , Counter clockwise }

