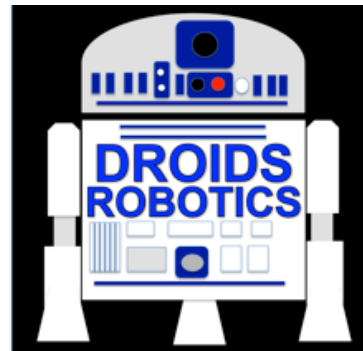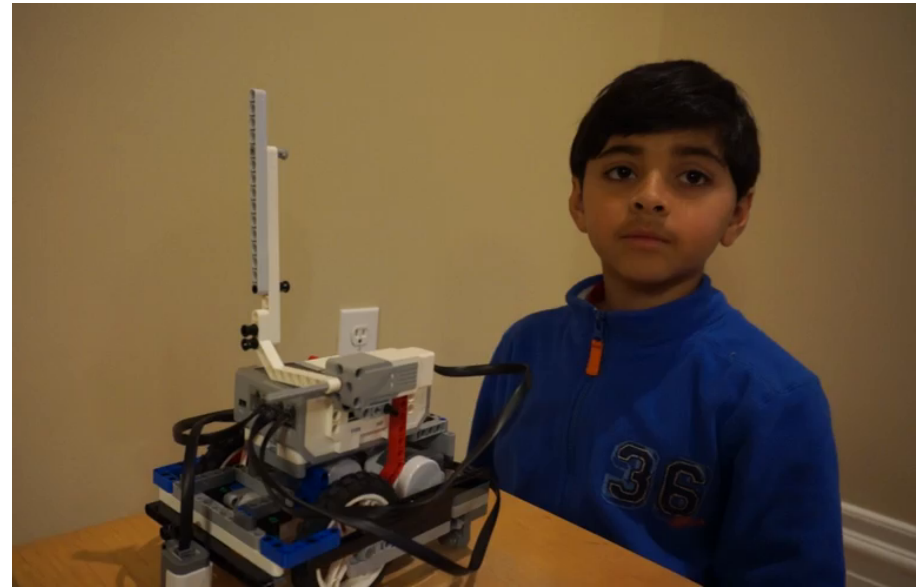# STALL DETECTION

By Droids Robotics and Hoosier Girlz

ADVANCED PROGRAMMING LESSON

What is an Stall Detection and Why use it?

- ⬈ Stall detection is a program that stops your motor when the motor gets stuck

- ⬈ When your motor gets stuck, you usually have to grab your robot and get a touch penalty

- ⬈ When you use stall detection techniques, your robot will move on to the next block

Click on Video to learn about Stall Detection

Move Degrees vs. Move Seconds

➚ In our lesson on Move Blocks (Intermediate tab), we said that if you use Move Degrees, your motor may get stuck

➚ We told you that Move Seconds helps avoid stalls, but is not as accurate

➚ Are these the only choices?

➚ How can you use Move Degrees and prevent stalls?

➚ We show you how in this lesson

Requirements

➚ In this lesson, you will need an arm connected to a motor

➚ We have set our code to use a medium motor connected to motor A – this can be changed to suit your team's needs

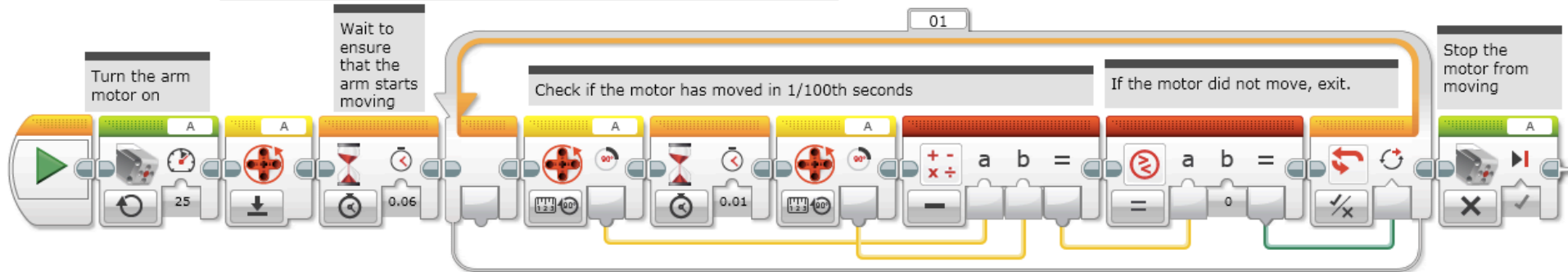➚ Follow along using the EV3 Code provided. Start with Step 1

Step 1: Move Until Stall

This code was originally made by Hoosier Girlz: www.fllhoosiergirlz.com with comments and modifications by Not The Droids You Are Looking For: www.droidsrobotics.org, www.ev3lessons.com

The goal of Step 1 is to stop the motor from moving when the arm hits an obstacle. (eg:wall, ground, mission model)
Psudocode:
1. Turn the motor on
2. Continuously check if the motor has moved over 1/100th seconds
3. If the motor has not made progress over 1/100th seconds, stop the motor
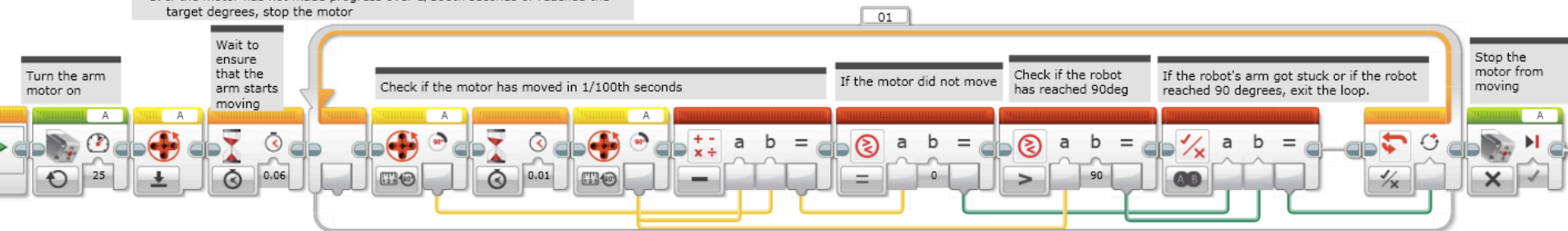
01

Turn the arm motor on

Wait to ensure that the arm starts moving

Check if the motor has moved in 1/100th seconds

If the motor did not move, exit.

Stop the motor from moving

Step 2a: Move Degrees + Stall Detection

This code was originally made by Hoosier Girlz: www.fllhoosiergirlz.com with comments and modifications by Not The Droids You Are Looking For: www.droidsrobotics.org, www.ev3lessons.com

The goal of this program is to stop the motor from moving when the arm hits an obstacle (eg:wall, ground, mission model) or if it moves an amount of degrees. Psudocode:
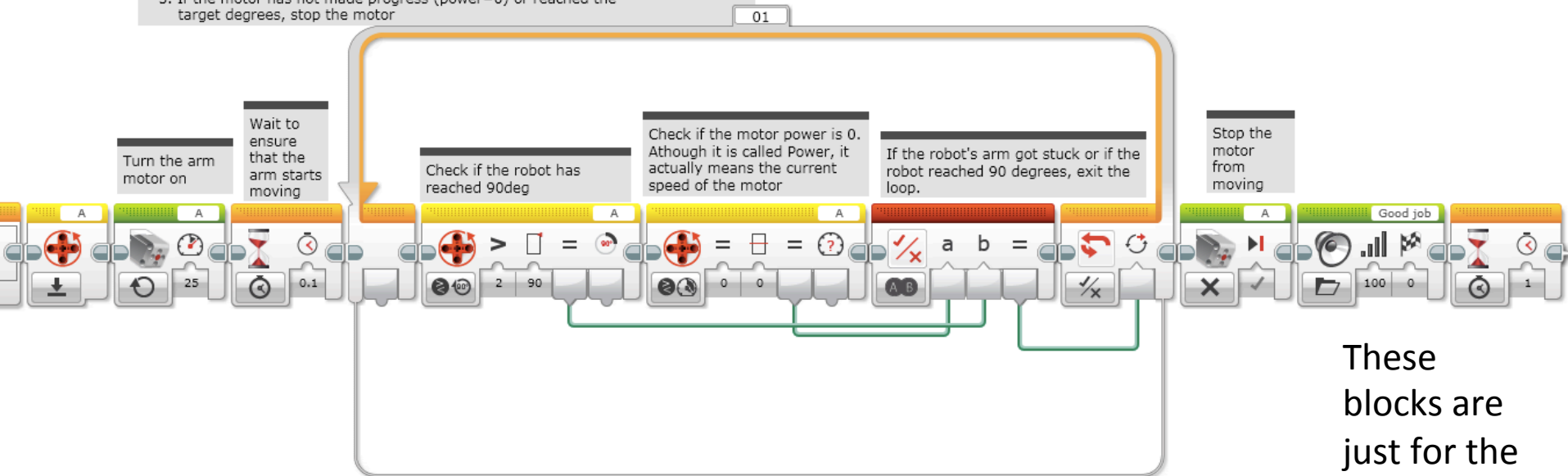1. Turn the motor on
2. Continuously check if the motor has moved over 1/100th seconds or has reached the target degrees
3. If the motor has not made progress over 1/100th seconds or reached the target degrees, stop the motor

Turn the arm motor on

Wait to ensure that the arm starts moving

Check if the motor has moved in 1/100th seconds

If the motor did not move

Check if the robot has reached 90deg

If the robot's arm got stuck or if the robot reached 90 degrees, exit the loop.

Stop the motor from moving

Step 2b: Alternate Move Degrees + Stall Detection

The goal of the Step 2 program is to stop the motor from moving when the arm hits an obstacle (eg:wall, ground, mission model) or if it moves an amount of degrees.
Psudocode:
1. Turn the motor on
2. Continuously check if the motor power is 0 or has reached the target degrees
3. If the motor has not made progress (power=0) or reached the target degrees, stop the motor

Turn the arm motor on

Wait to ensure that the arm starts moving

Check if the robot has reached 90deg

Check if the motor power is 0. Although it is called Power, it actually means the current speed of the motor

If the robot's arm got stuck or if the robot reached 90 degrees, exit the loop.

Stop the motor from moving

These blocks are just for the video

Credits

➚ This lesson was created by Sanjay and Arvind Seshan from Droids Robotics. The Code was created by both Hoosier Girlz and Droids Robotics.

   ➚ Step 1 and 2a by www.fllhoosiergirlz.com

   ➚ Step 2a and 2b by www.droidsrobotics.org

➚ Please give credit to the teams who authored the code.

➚ More lessons at www.ev3lessons.com