

The Robot Program Episode 021: Detect Face and Wave - Blockly

This lesson will demonstrate how to use [b]Blockly[/b] to have the robot wave once it detects a face. At the end of this lesson, readers will be able to enable facial detection and code a basic script using [b]Blockly[/b]. Follow along with The Robot Program Episode 021: Detect Face and Wave - Blockly. View the video episode here: <https://www.ez-robot.com/Tutorials/Lesson/95>

Last Updated: 6/12/2018

Professor E's Overview

This lesson demonstrated how to enable facial detection and how to trigger an action using a **Blockly** script.

Always start with a fully charged, disconnected robot. **Load EZ-Builder** and connect to the robot. Open the bare robot project, which provides a clean workspace without unnecessary controls. Add the control for the camera and test the camera view. The camera will provide peripheral information (external input/output that can be used to provide information).

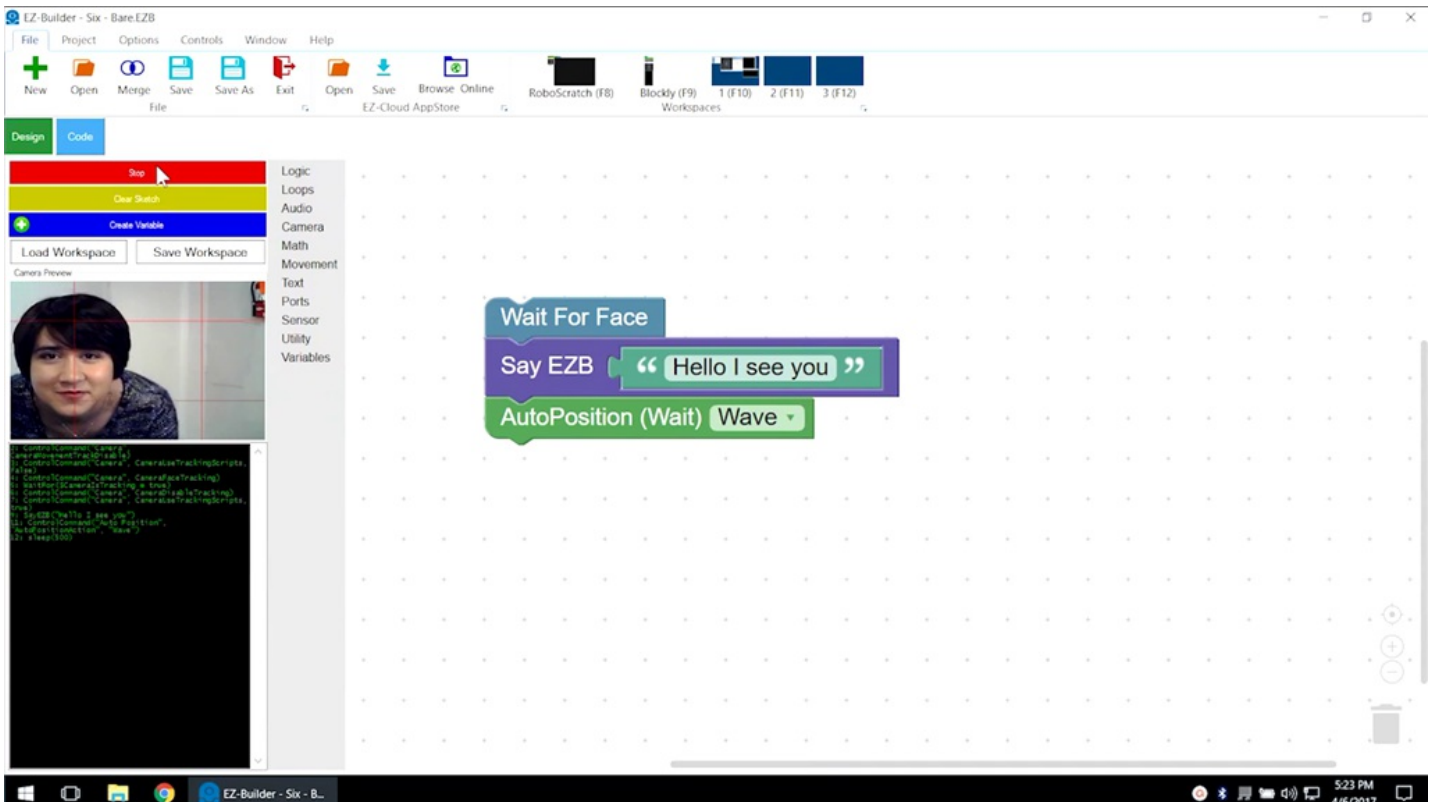
Open the **Blockly** workspace. Add the **Wait For Face** command. This command tells the robot to wait until it detects a face before moving on to the next line of code.

Add **Say EZB** and type in the desired speech. This command does not include a **Wait**, so it will execute and move immediately to the next command while the robot is still speaking. The audio will be output through the **EZ-B Robot Controller**.

Add **AutoPosition (Wait)** and choose an action, such as **Wave**. The use of **Wait** means that the action will be fully completed before moving on to the next line of code.

Click on **Start** to begin execution. Use the **Code** tab to view the **EZ-Script** code that was generated by the **Blockly** commands.

Remember to disconnect, power off, and charge the robot when finished.



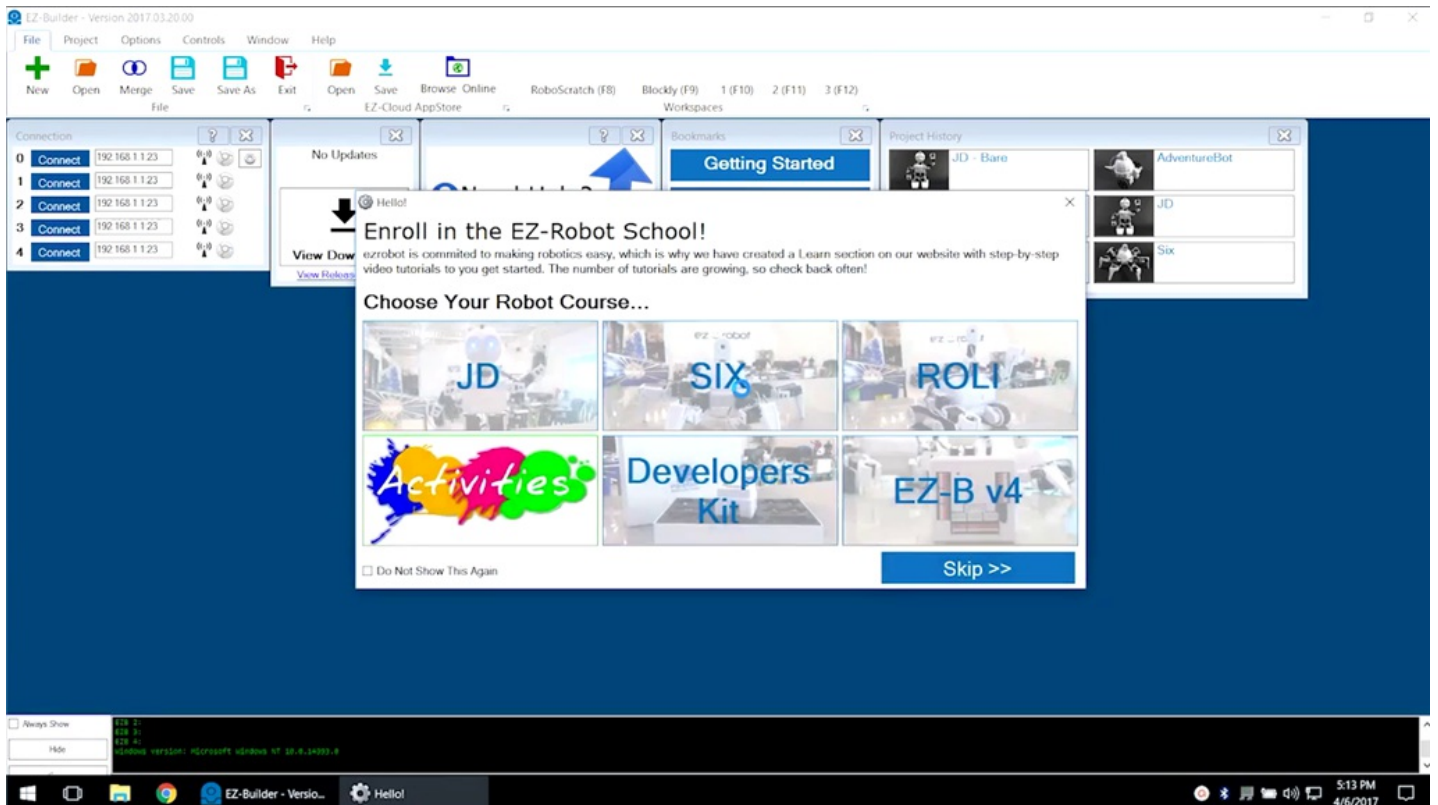
The screenshot displays the EZ-Builder software interface. The top menu bar includes File, Project, Options, Controls, Window, and Help. Below the menu is a toolbar with icons for New, Open, Merge, Save, Save As, Exit, and various workspace management options. The main workspace is divided into Design and Code tabs. The Design tab is active, showing a grid-based Blockly workspace. A script is built with three blocks: 'Wait For Face' (blue), 'Say EZB' (purple) with the text 'Hello I see you', and 'AutoPosition (Wait) Wave' (green). On the left side, there is a 'Camera Preview' window showing a video feed of a person's face. Below the preview is a 'Code' window displaying the generated EZ-Script code. The bottom status bar shows the system tray with the time 5:23 PM and date 4/6/2017.

Step 1

Learn how to use **RoboScratch** to make the robot wave when it recognizes a face. Always begin with a fully charged robot. This example will use **Revolution JD**.

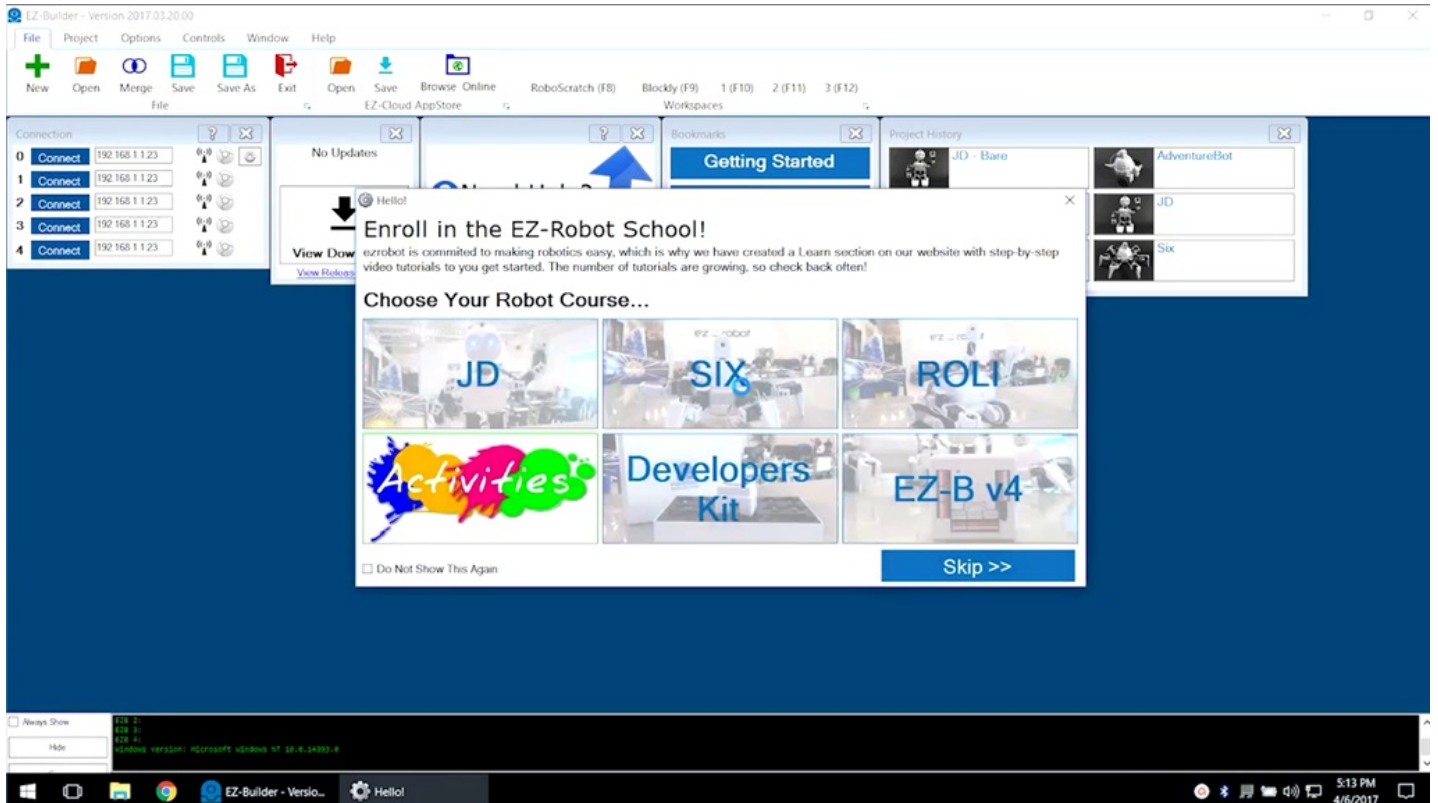


Load the **EZ-Builder** software.

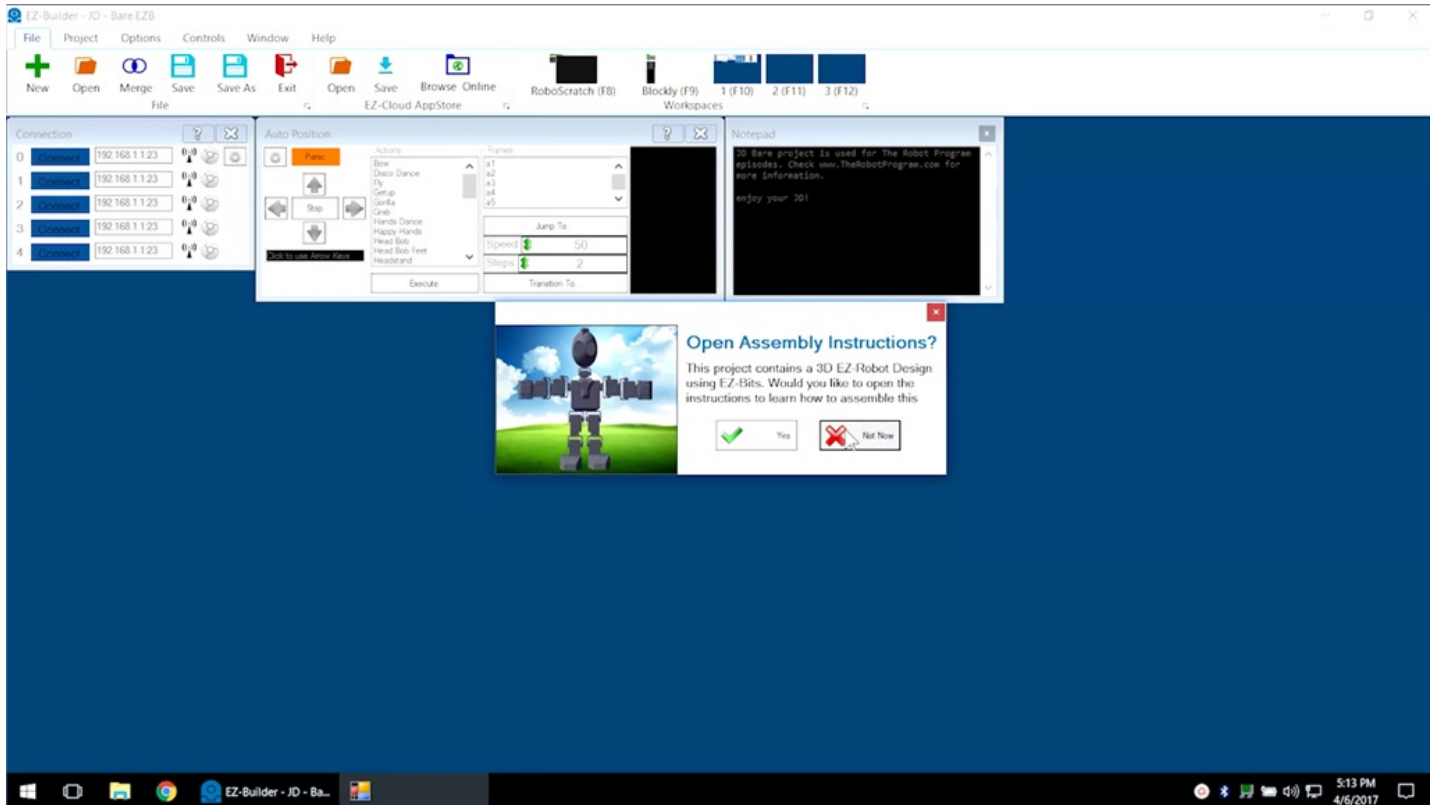


Step 3

From **Example Projects**, open the bare project for the desired robot.

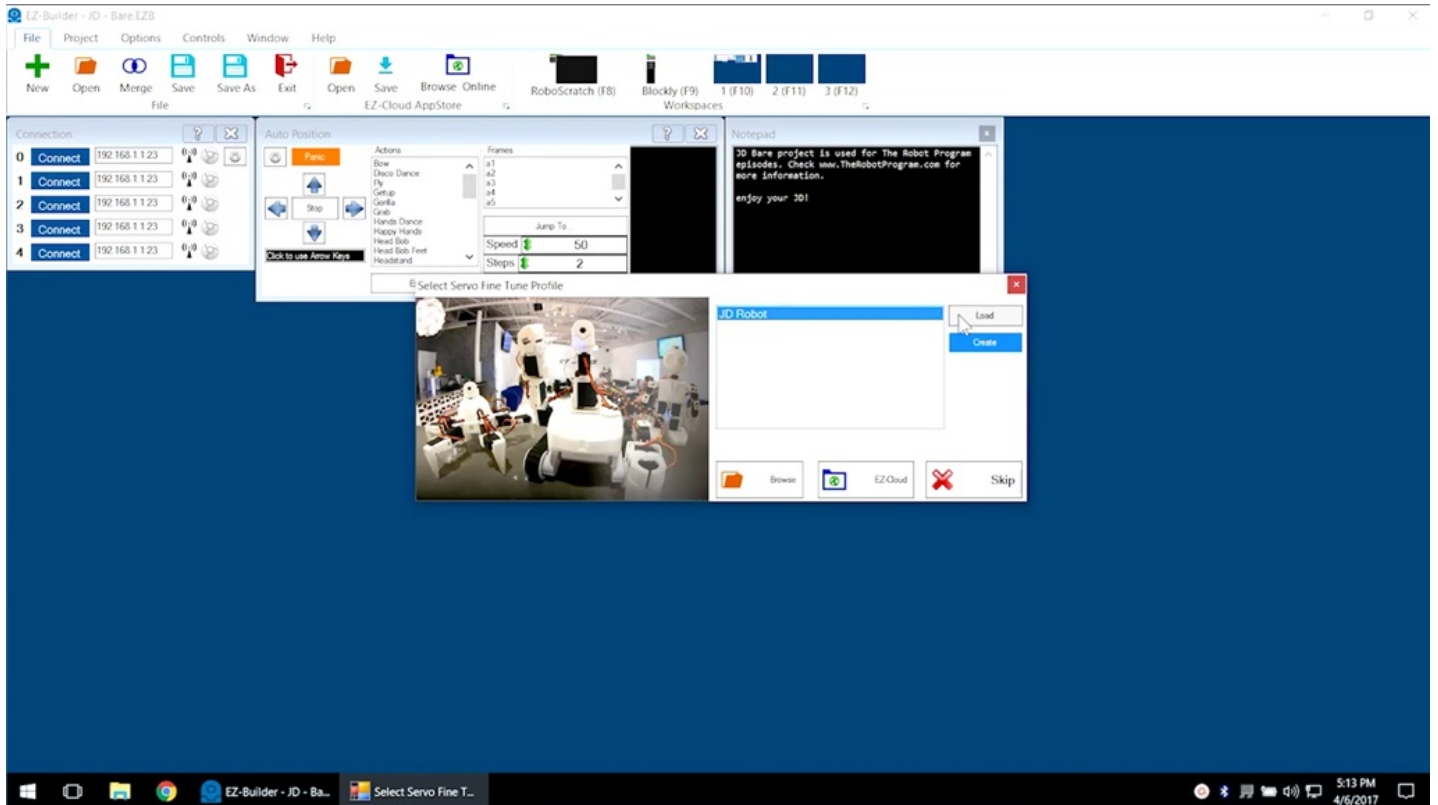


Skip the build instructions. View past episodes for more build information.



Step 5

If using **Revolution JD**, load the calibrated servo profile.



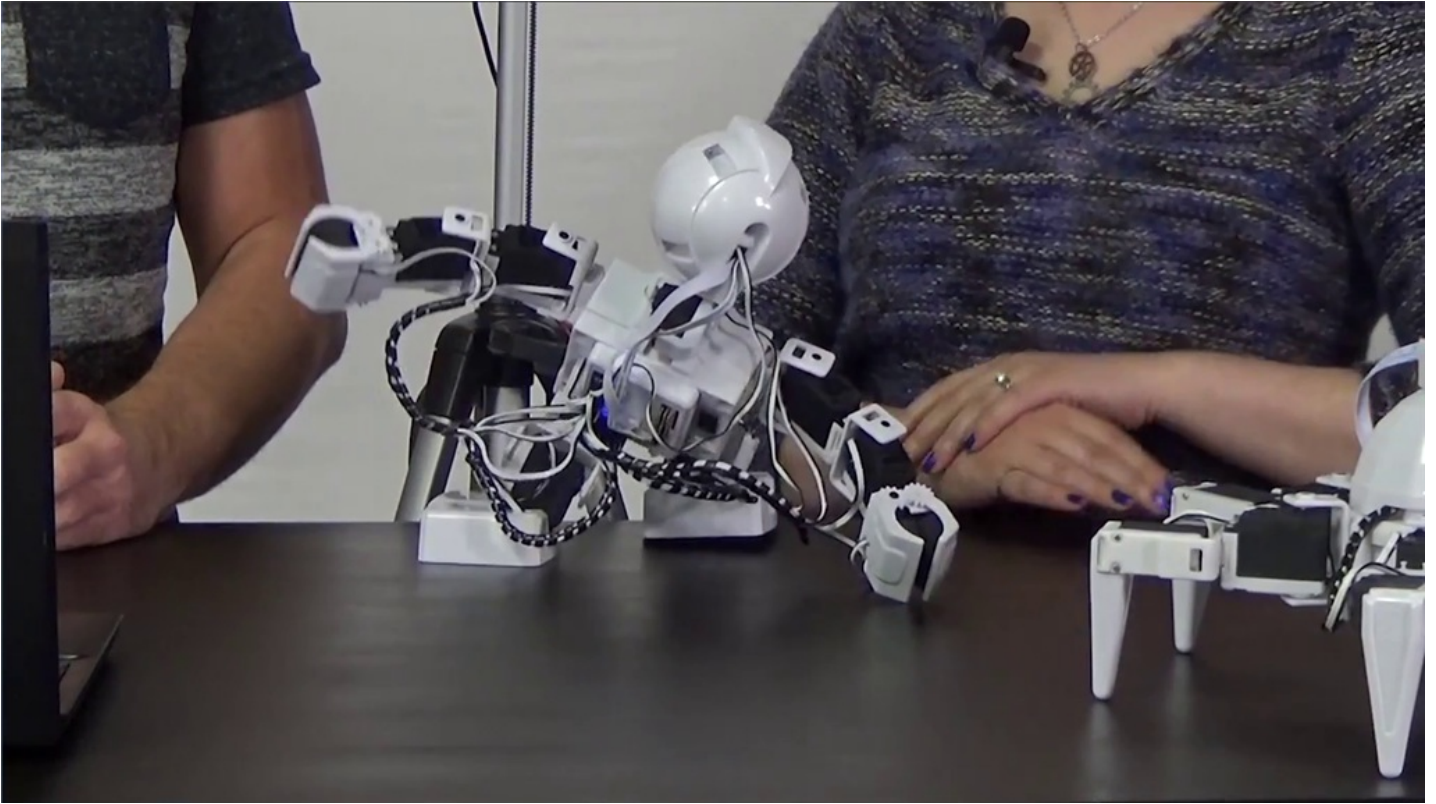
Step 6

Power on the fully charged robot. Use Wi-Fi to connect to the EZ-B and click on the blue **Connect** button.

The screenshot displays the EZ-Builder software interface. The main window shows a 'Connection' panel on the left with five entries, all labeled 'Connect' and showing the IP address '192.168.1.123'. The central panel is titled 'Auto Position' and contains a 'Panic' button, a list of actions (Bow, Disco Dance, Fly, Gait, Gonka, Grab, Hands Dance, Happy Hands, Head Bob, Head Bob Feet, Headstand), and a 'Frames' list (a1-a5). Below the actions is a 'Speed' slider set to 50 and a 'Steps' field set to 2. The right panel is a 'Notepad' window containing the text: '3D Bare project is used for The Robot Program episodes. Check www.TheRobotProgram.com for more information. enjoy your 3D!'. The Windows taskbar at the bottom shows the time as 5:16 PM on 4/6/2017. The network settings panel on the right shows 'Ethernet Connected', 'EZ-B w4 JD1 Open' with a 'Connecting' status and a 'Cancel' button, and several other Wi-Fi networks including 'ez-education Secured', 'EZ-Robot 3 Secured', 'EZ-Robot Guest Secured', and 'EZ-Robot Operations'. The 'Wi-Fi' icon is highlighted in blue, and 'Airplane mode' is also visible.

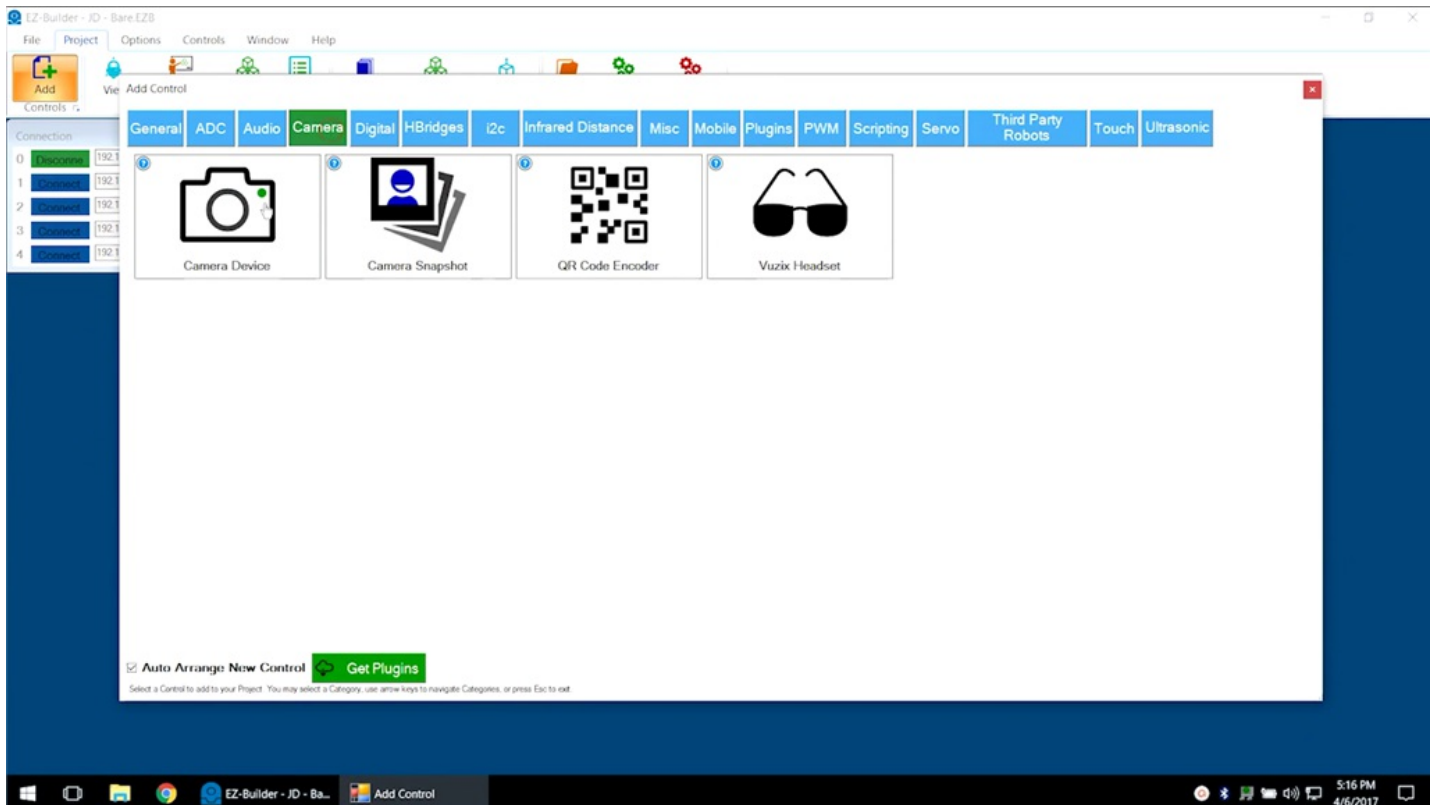
Step 7

If using **Revolution JD**, execute **Stand From Sit** in the **Auto Position** control window to bring the robot to a standing position.



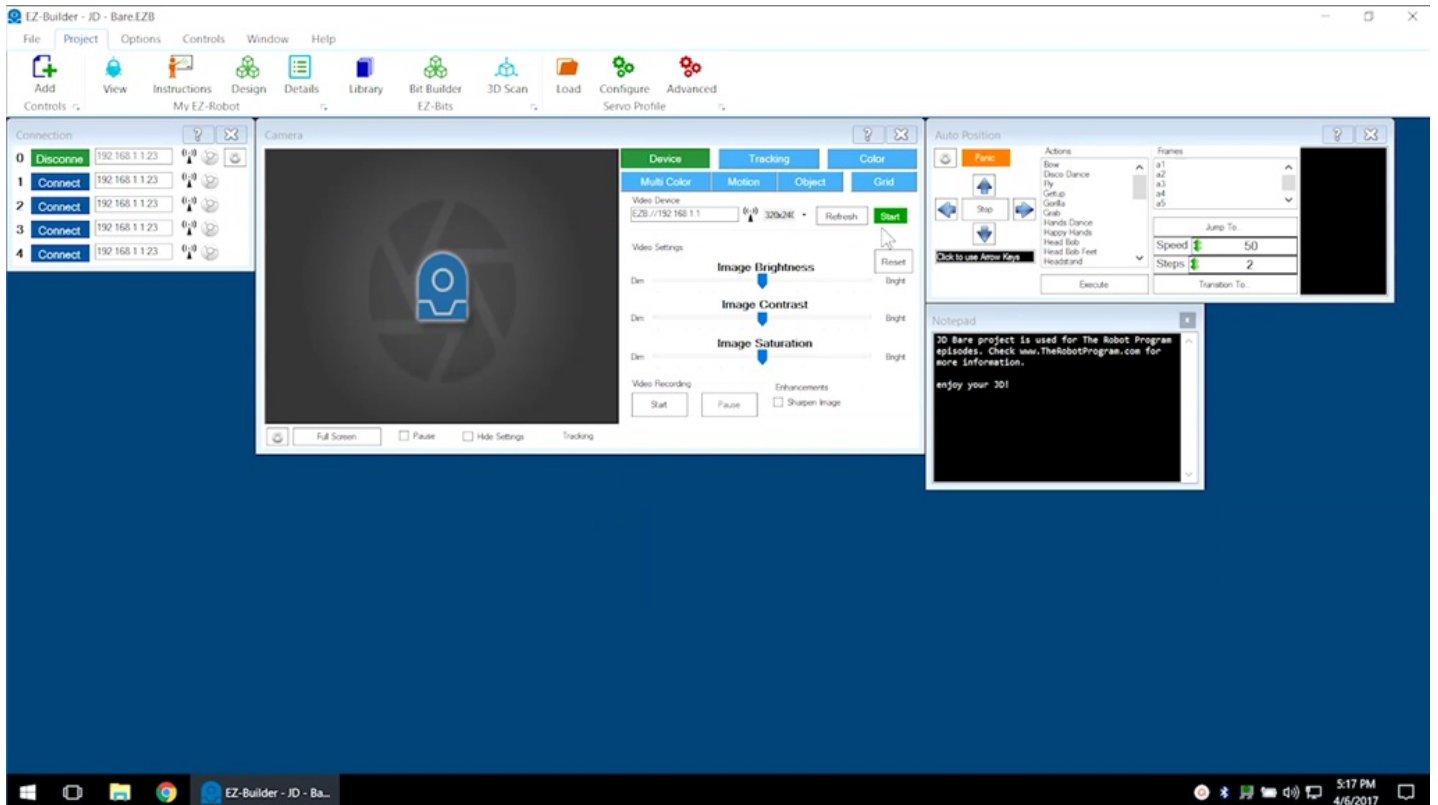
Step 8

Select **Project** -> **Add Controls** -> **Camera** -> **Camera Device** to add the camera controls.



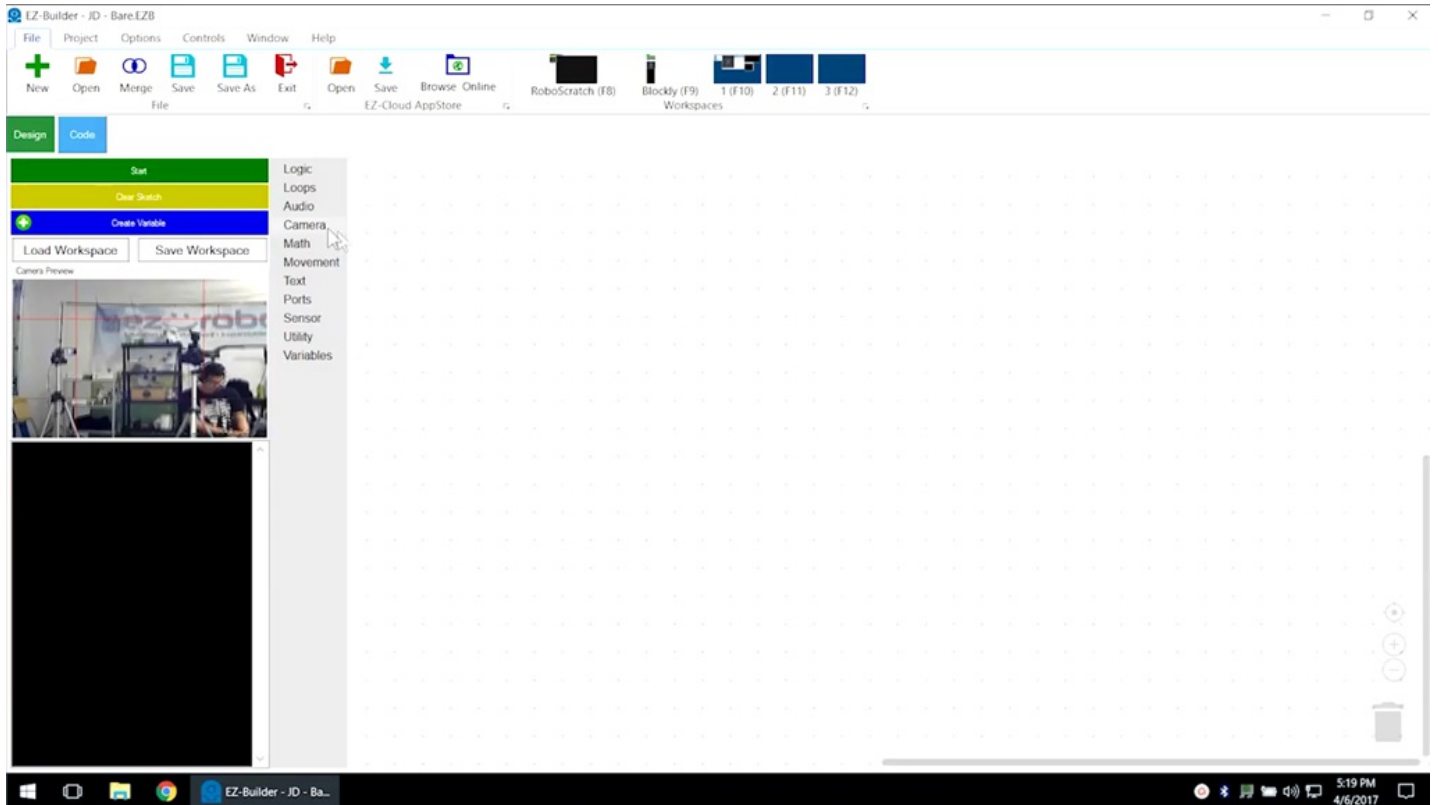
Step 9

Push the green **Start** button to connect to the camera. The camera will provide peripheral information that will be used within the program.



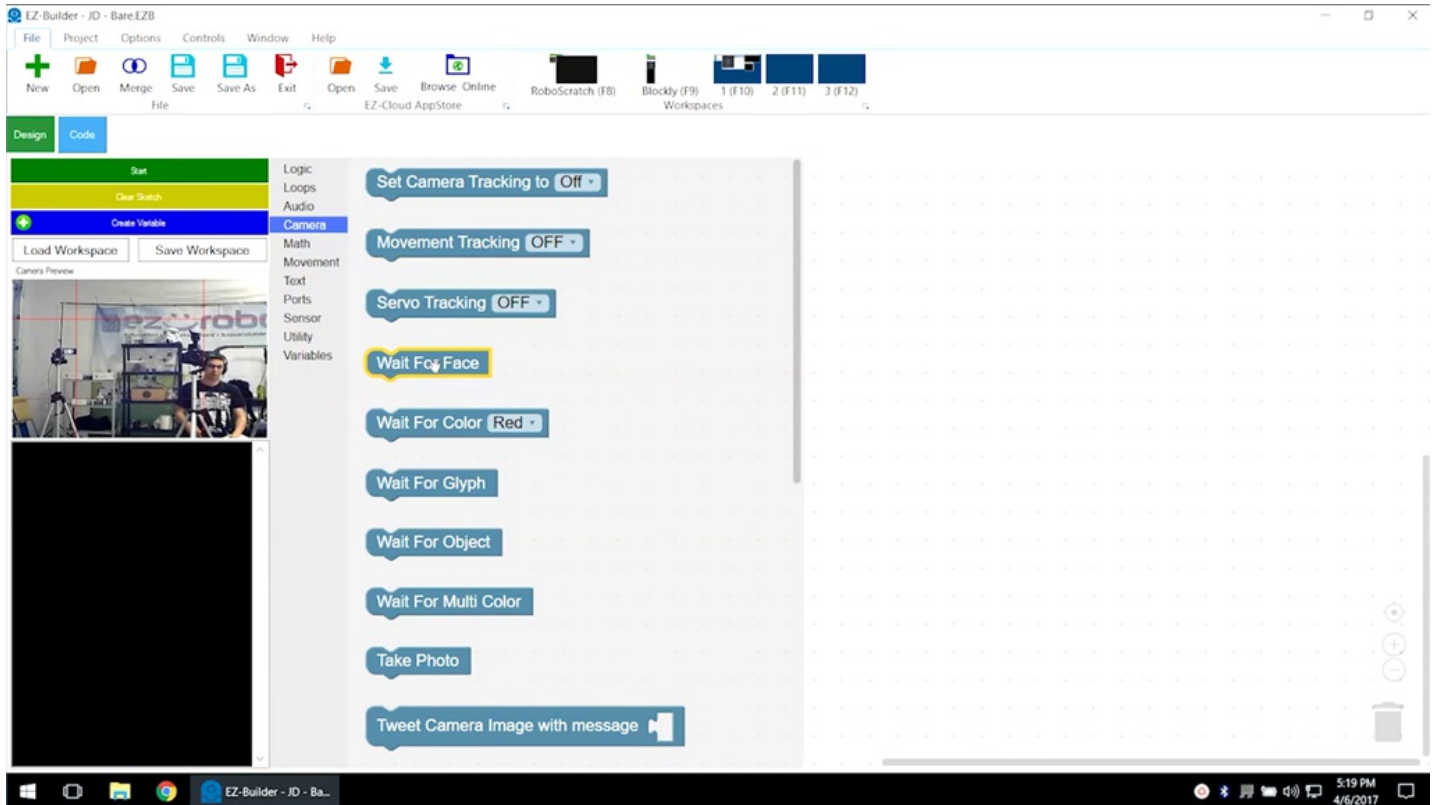
Step 10

Select **File** -> **Blockly** to enter the **Blockly** workspace for graphical programming.



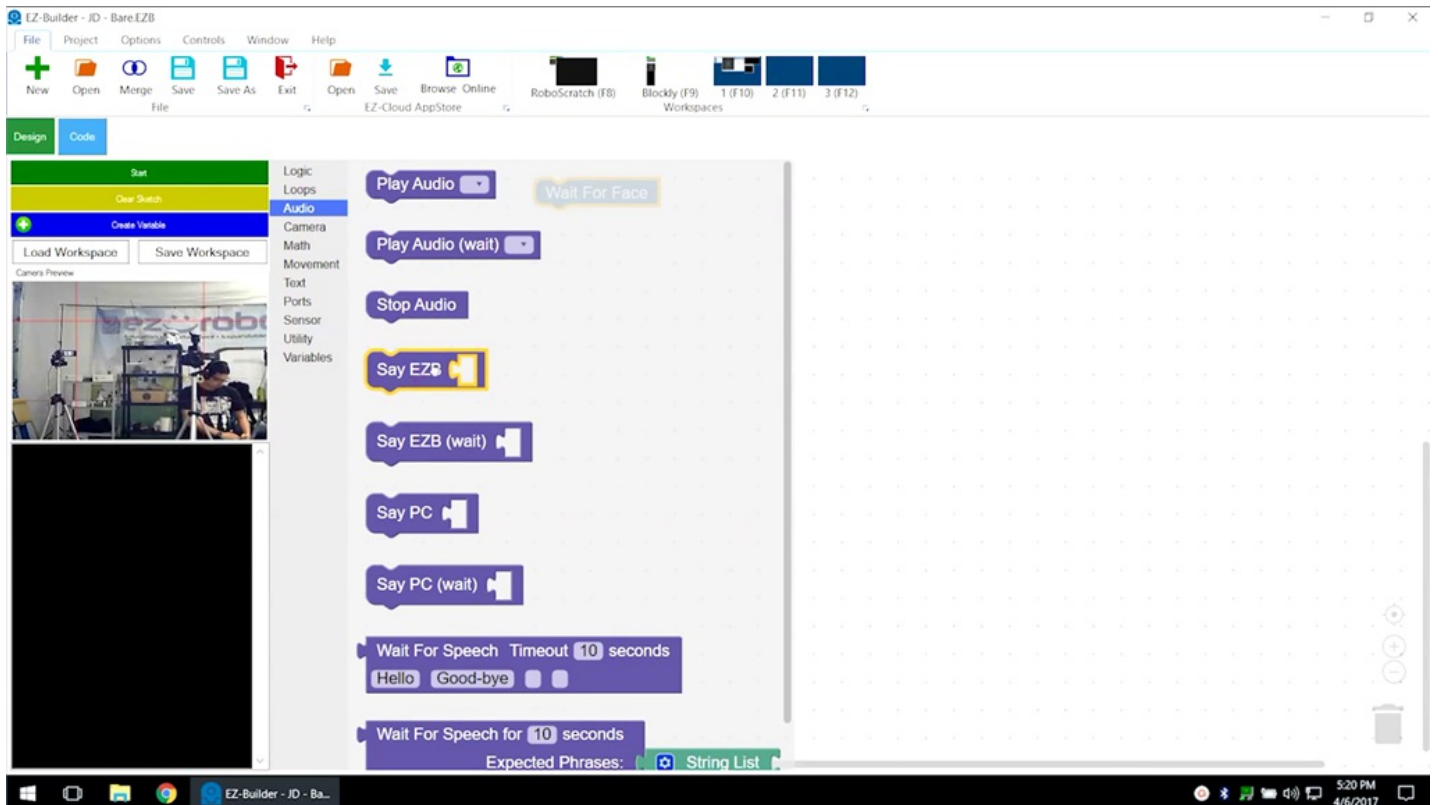
Step 11

Select **Camera** from the menu, then click and drag **WaitForFace** into the editing space.



Step 12

From the **Audio** tab, click and drag **Say EZB** underneath the previous command.



The screenshot displays the EZ-Builder software interface. The main window is titled "EZ-Builder - JD - Bare.EZB". The top menu bar includes "File", "Project", "Options", "Controls", "Window", and "Help". Below the menu is a toolbar with icons for "New", "Open", "Merge", "Save", "Save As", "Exit", "Open", "Save", "Browse Online", "EZ-Cloud AppStore", "RoboScratch (F8)", "Blockly (F9)", and "Workspaces".

The interface is divided into several sections:

- Design** and **Code** tabs are visible at the top left.
- Start** and **Clear Script** buttons are present.
- Create Variable** button is located below the Start buttons.
- Load Workspace** and **Save Workspace** buttons are also present.
- Camera Preview** section shows a live video feed of a person at a workstation.
- Logic** and **Loops** sections are visible on the left side of the script editor.
- Audio** tab is selected, showing a list of audio-related commands:

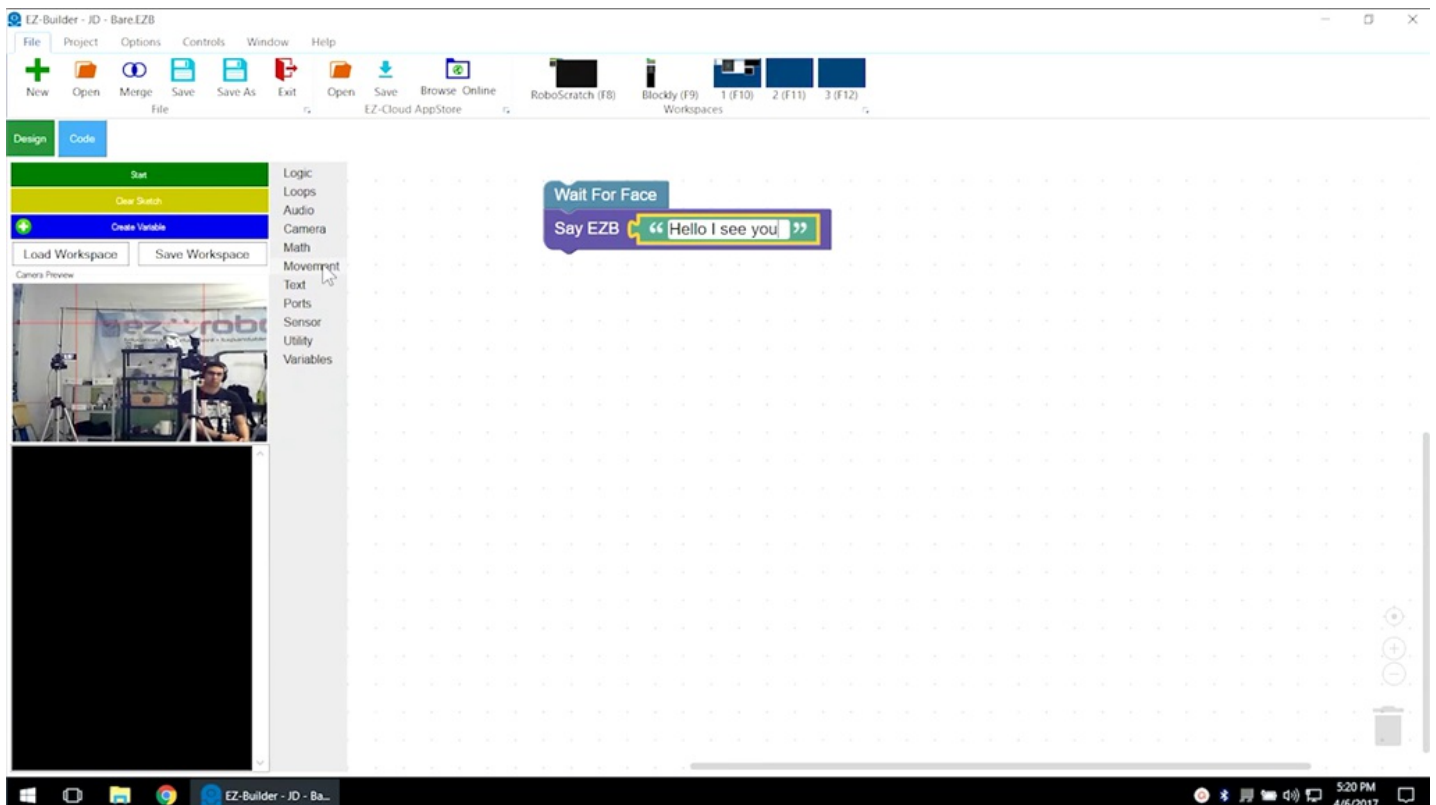
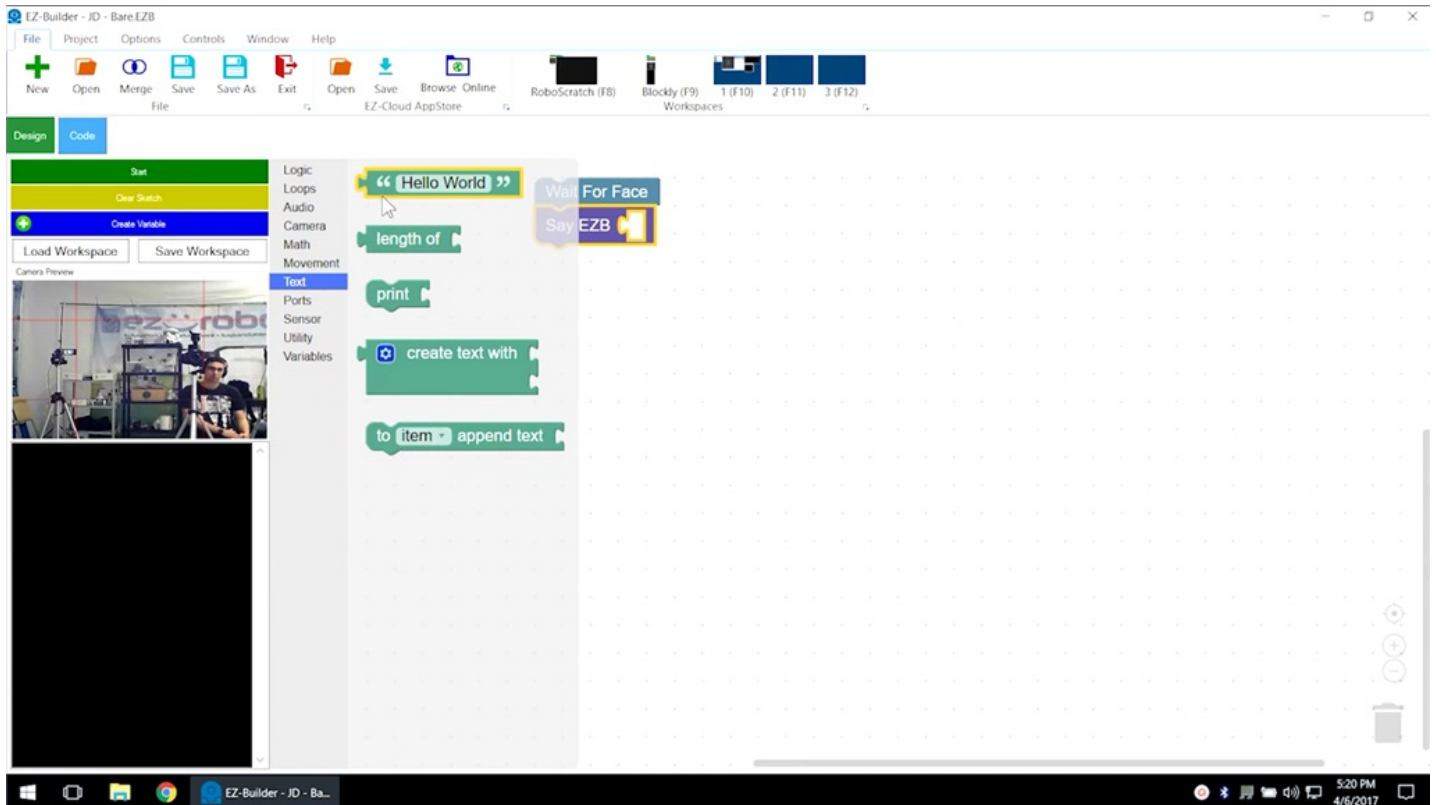
The script editor contains the following sequence of commands:

- Play Audio
- Wait For Face
- Play Audio (wait)
- Stop Audio
- Say EZB (highlighted in yellow)
- Say EZB (wait)
- Say PC
- Say PC (wait)
- Wait For Speech Timeout 10 seconds
Hello Good-bye
- Wait For Speech for 10 seconds
Expected Phrases: String List

The Windows taskbar at the bottom shows the system tray with the time 5:20 PM and date 4/6/2017.

Step 13

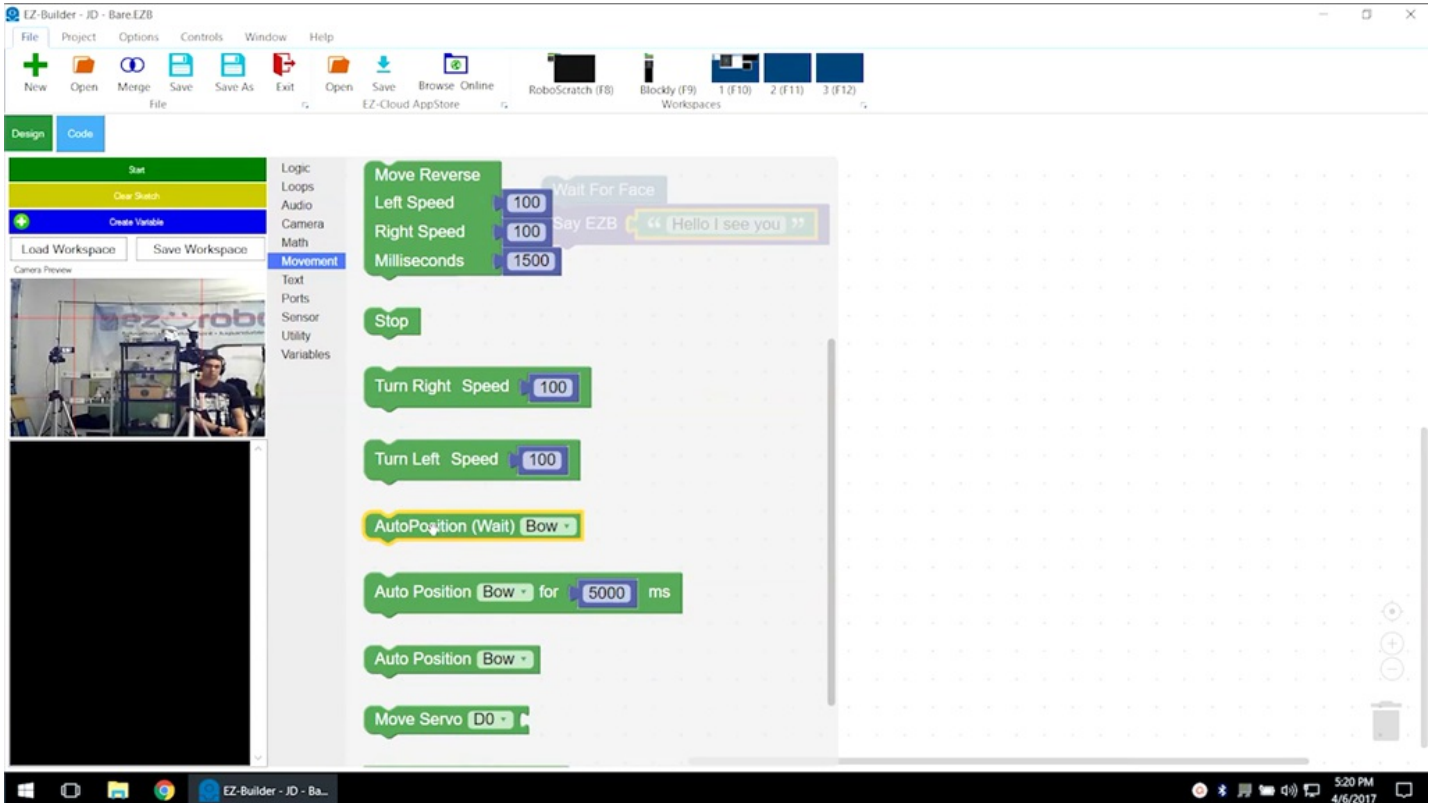
From the **Text** tab, add blank text to the audio command. Type **Hello I see you** between the quotation marks.



Step 14

Select **Movement** from the menu, then click and drag **AutoPosition (Wait)** underneath the previous command.

Functions that have **(Wait)** in their name will run completely before moving on to the next command.



The screenshot displays the EZ-Builder software interface. The top menu bar includes File, Project, Options, Controls, Window, and Help. Below the menu is a toolbar with icons for New, Open, Merge, Save, Save As, Exit, Open, Save, Browse Online, EZ-Cloud AppStore, RoboScratch (F8), Blockly (F9), and Workspaces (1 (F10), 2 (F11), 3 (F12)).

The main workspace is divided into two tabs: Design and Code. The Code tab is active, showing a logic editor with a grid background. The left sidebar contains a menu with categories: Logic, Loops, Audio, Camera, Math, Movement, Text, Ports, Sensor, Utility, and Variables. The Movement category is selected, and the 'AutoPosition (Wait) Bow' block is highlighted.

The logic editor contains the following blocks in sequence:

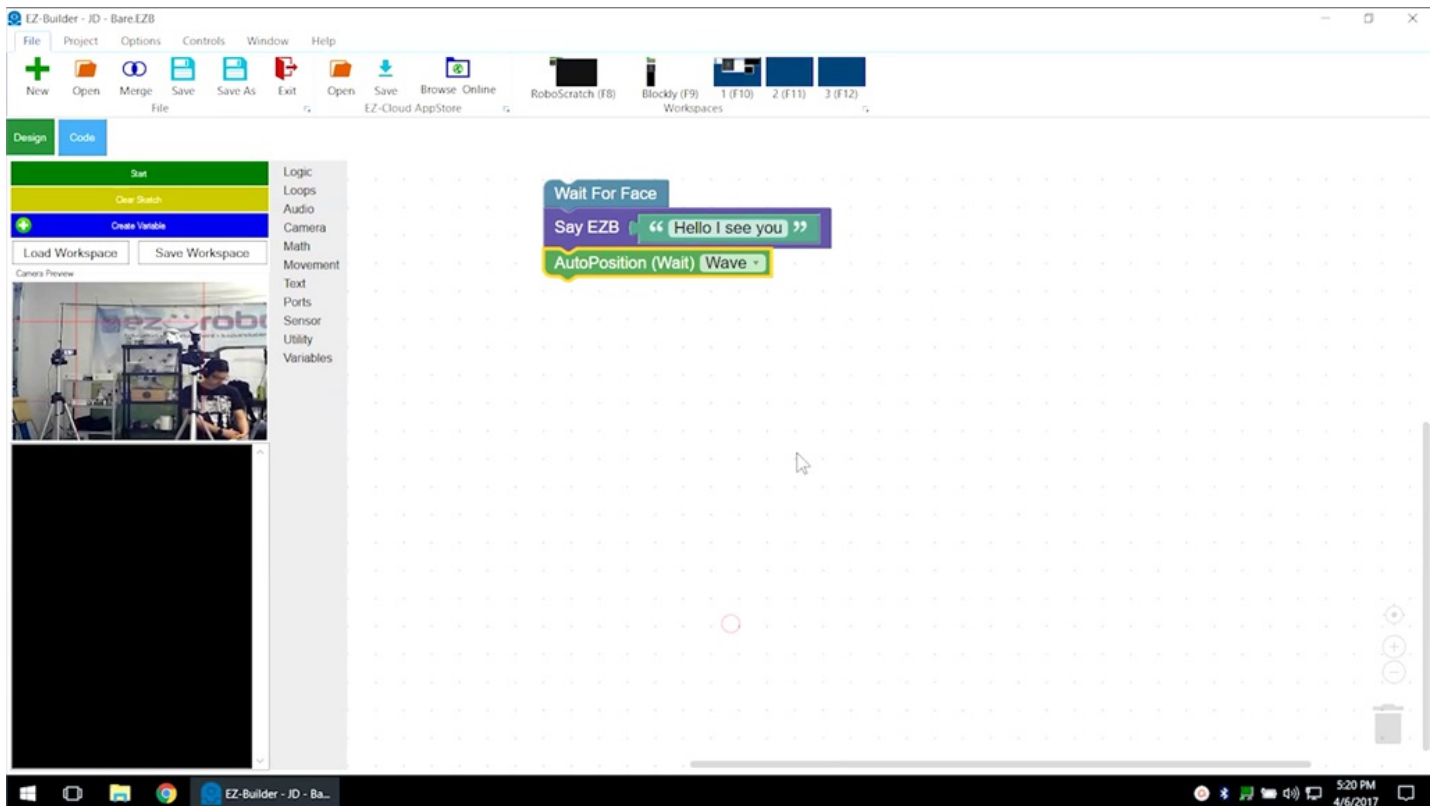
- Move Reverse
- Left Speed 100
- Right Speed 100
- Milliseconds 1500
- Wait For Face
- Say EZB "Hello I see you"
- Stop
- Turn Right Speed 100
- Turn Left Speed 100
- AutoPosition (Wait) Bow
- Auto Position Bow for 5000 ms
- Auto Position Bow
- Move Servo D0

The bottom status bar shows the system tray with icons for network, volume, and power, along with the time 5:20 PM and date 4/6/2017.

Step 15

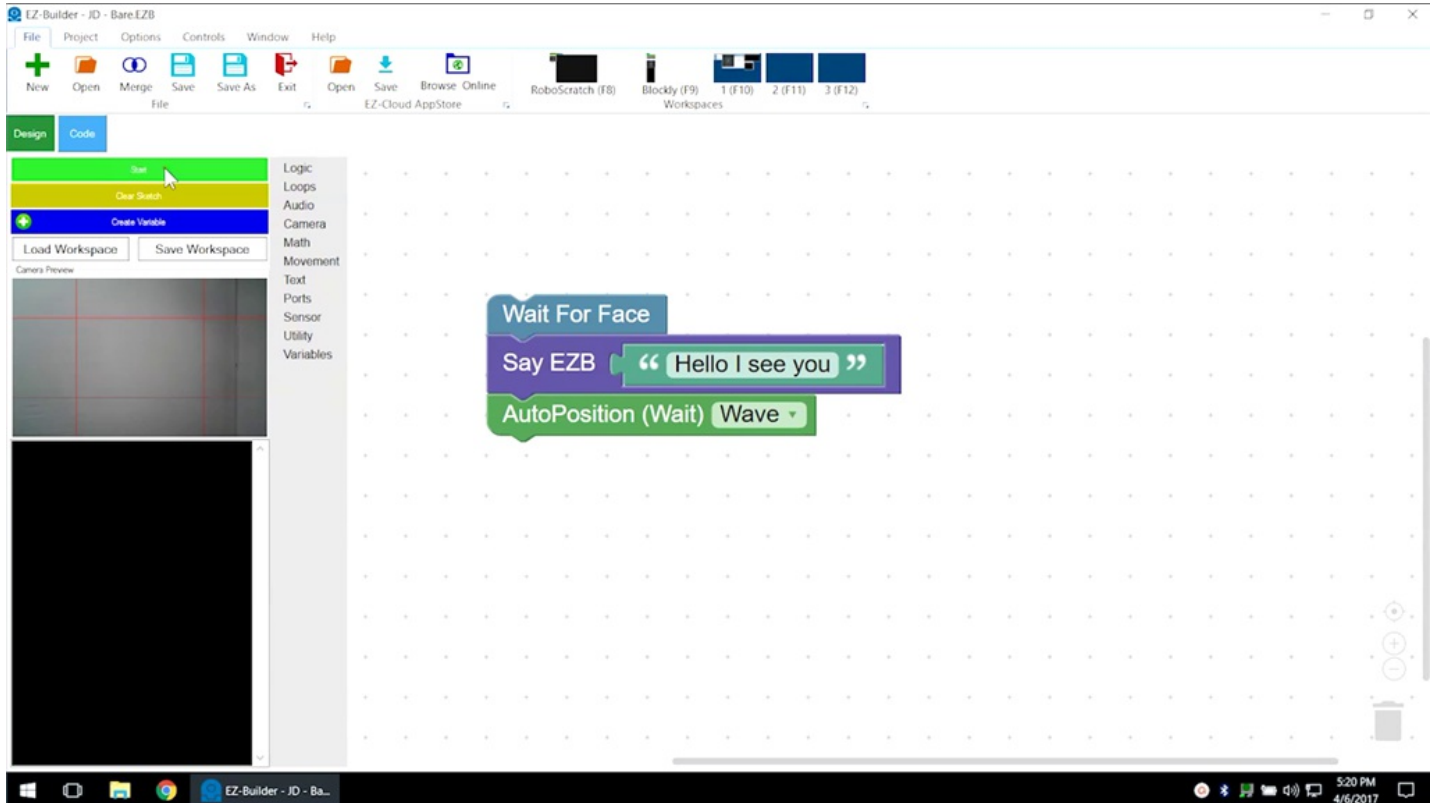
Choose **Wave** from the list of action options.

These three components will cause the robot to speak and wave once a face is detected.



Step 16

Execute the program using the green **Start** button. Follow the green line and highlighting as the program runs.



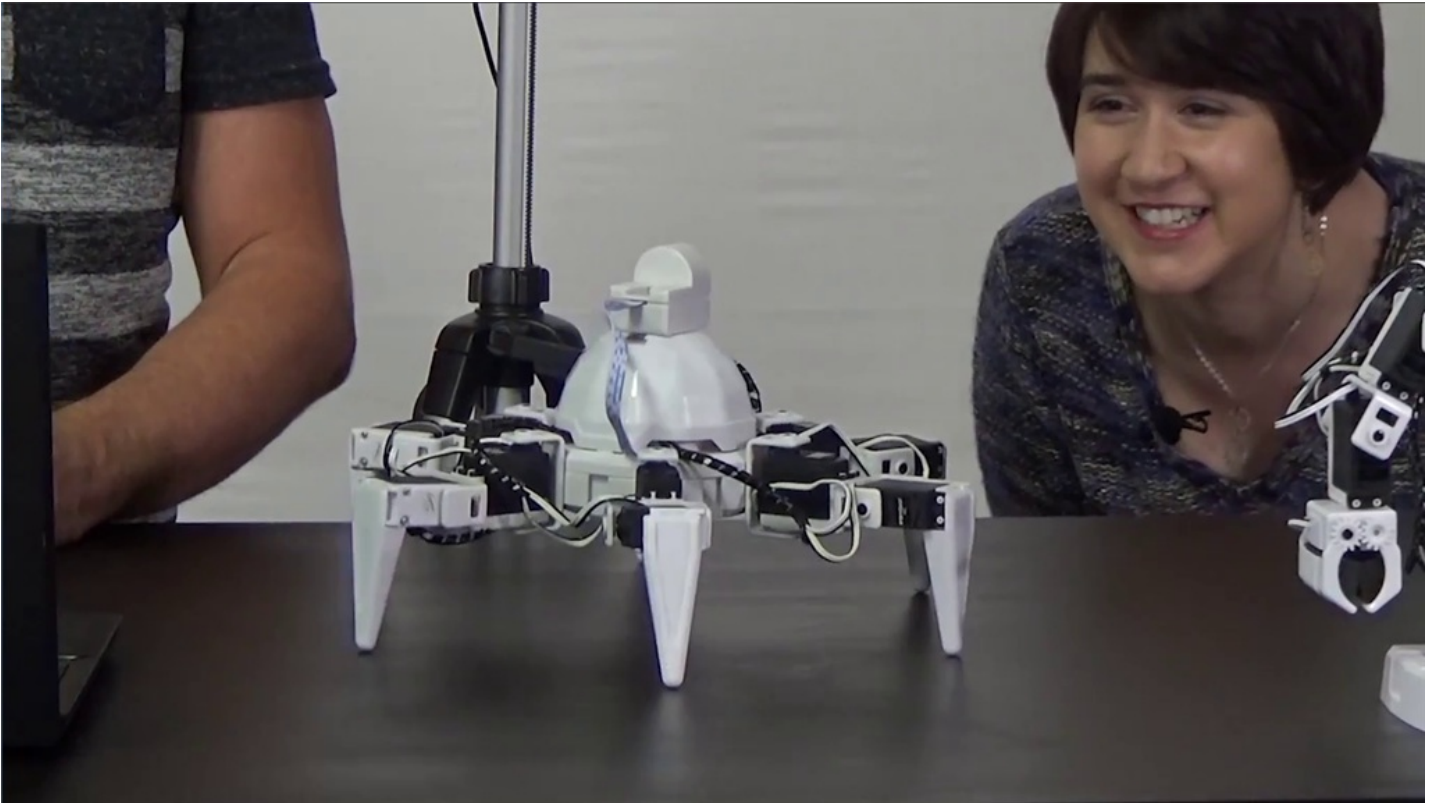
Step 17

Once the robot detects a face, it will speak and complete the wave action.



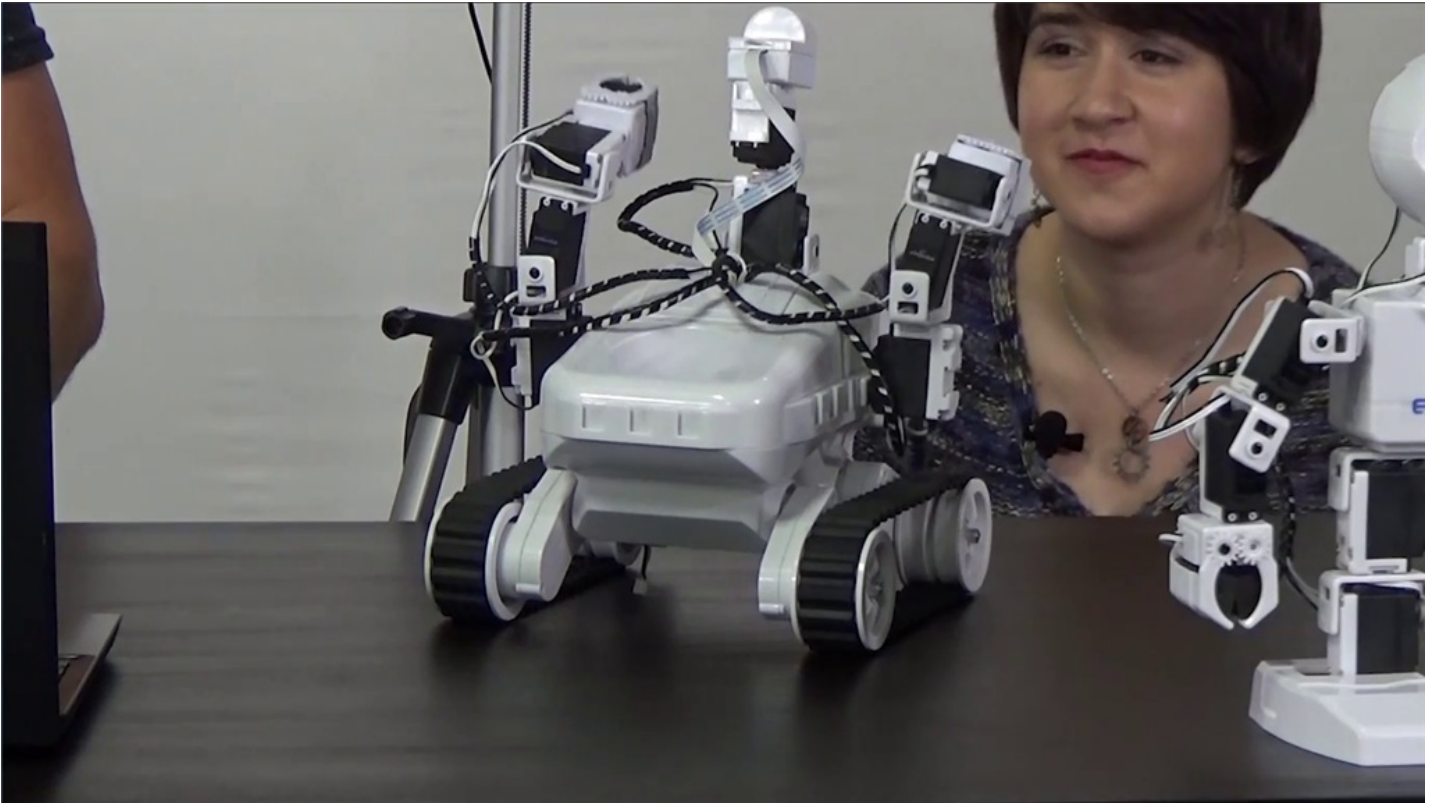
Step 18

Revolution Six will execute the same steps.



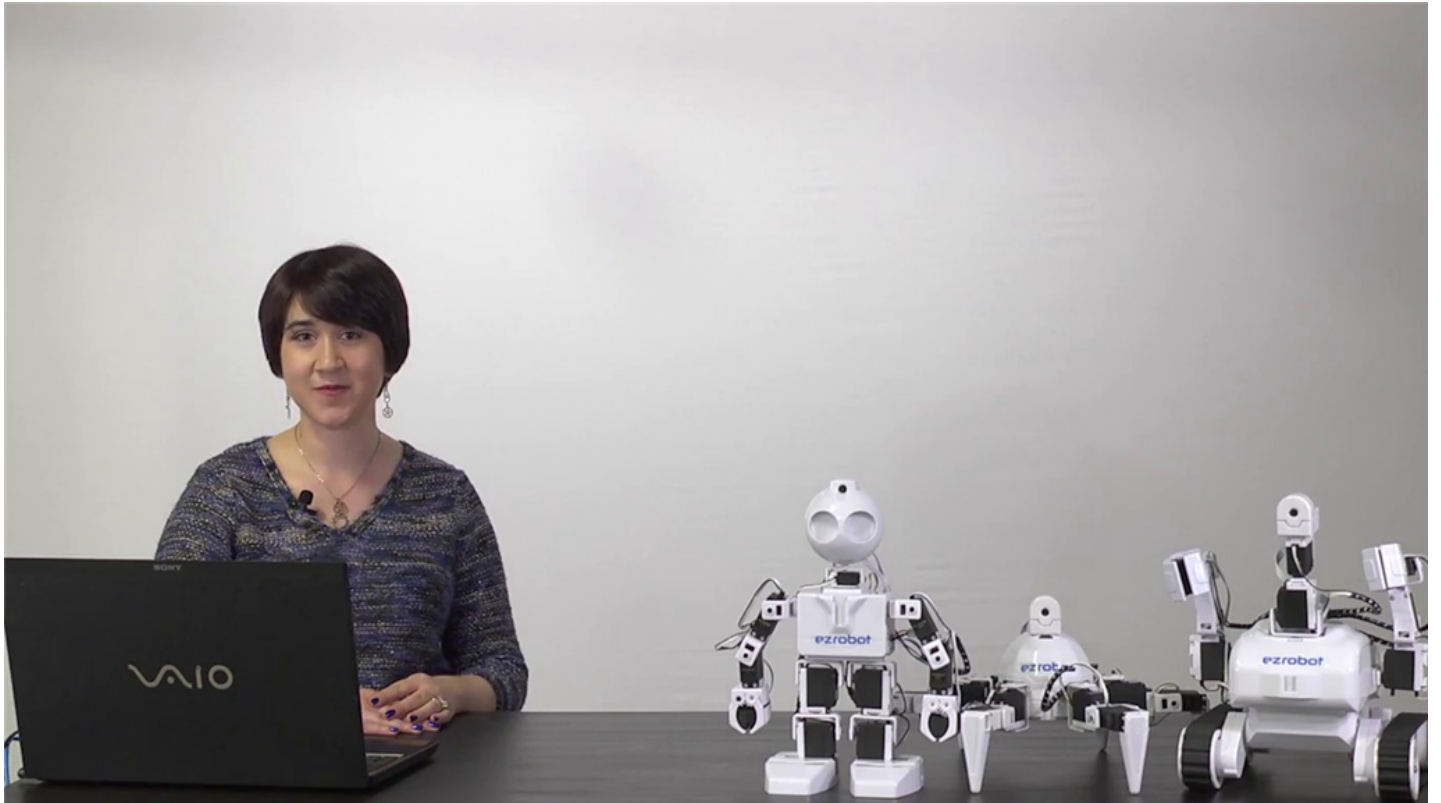
Step 19

Revolution Roli will execute the same steps.



Step 20

Save the project for future use.



Question #1

Why is a camera a peripheral device?

Question #2

Which command was used to convert text to robot audio output?

Question #3

What does AutoPosition (Wait) mean?

View the answers to this quiz at www.ez-robot.com/Tutorials/Lesson/95.

Visit www.TheRobotProgram.com for more episodes.