Quick-access guide for the Robotics Remote Lab

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1. Goal

The goal of this document is to show briefly how a user may access LabsLand's Robotics Remote Lab. The lab has been created to teach how to program an Arduino-based robot (Pololu's Zumo), through the Blockly visual language.

2. Steps to follow

1. A robotics remote laboratory is a platform. Through the Internet, it lets you try the behavior of the programs you create in a real robot. To access the Robotics Remote Laboratory that LabsLand offers, you first need to register in https://labsland.com. The register process is very easy and you can register using your LinkedIn, Gmail or Facebook account.
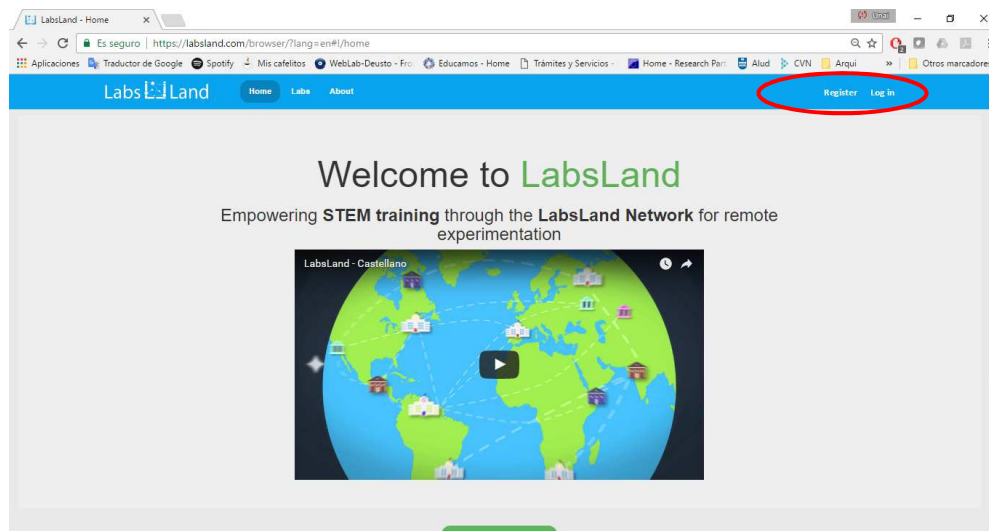

2. Once you have registered you will be able to access every laboratory that is available in https://labsland.com.
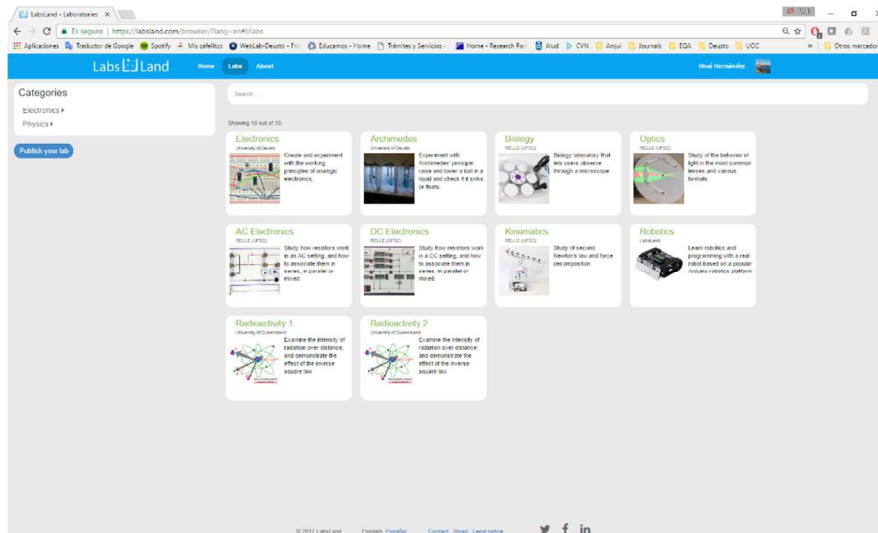
3. In this particular case, to access the Robotics Remote Laboratory, you will need to click on its card, or alternatively, go directly to: https://about.labsland.com/web/arduino_robot.


4. From this link you will access another screen, in which you will find more information about the robot and its accessing, clicking on the "Try laboratory" button.
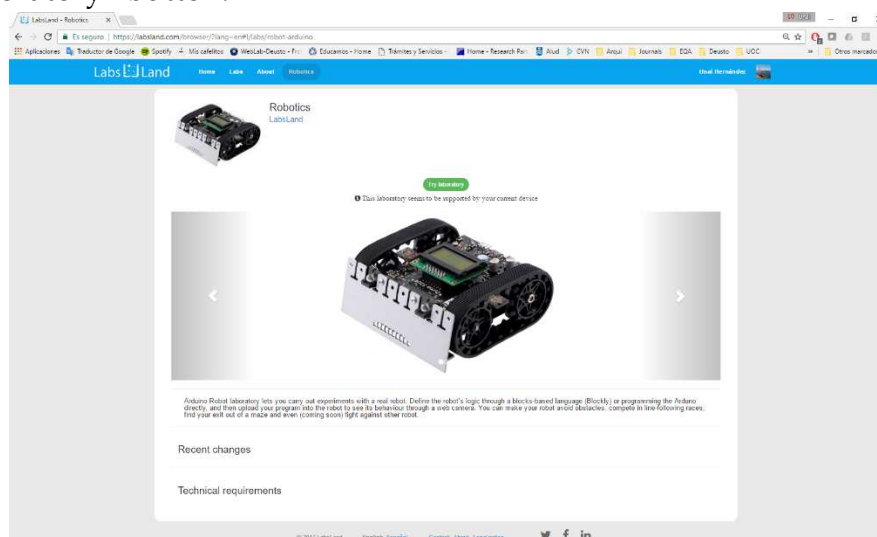

5. In the next screen you will find different ways to interact with the

laboratory. The logical order is to, first, access the **Block-Based Visual Programming Interface**. Once you have programmed and compiled your program without errors, you may access the **Arduino Remote Lab**, in which you will be able to see for yourself how the robot runs the program you have created.

6. In an extended version of the laboratory (not in the demo) you will also be able to compete among your students or with other users. This way, they will be able to compare the time they take, for example, to circle the circuit once in the available circuits.
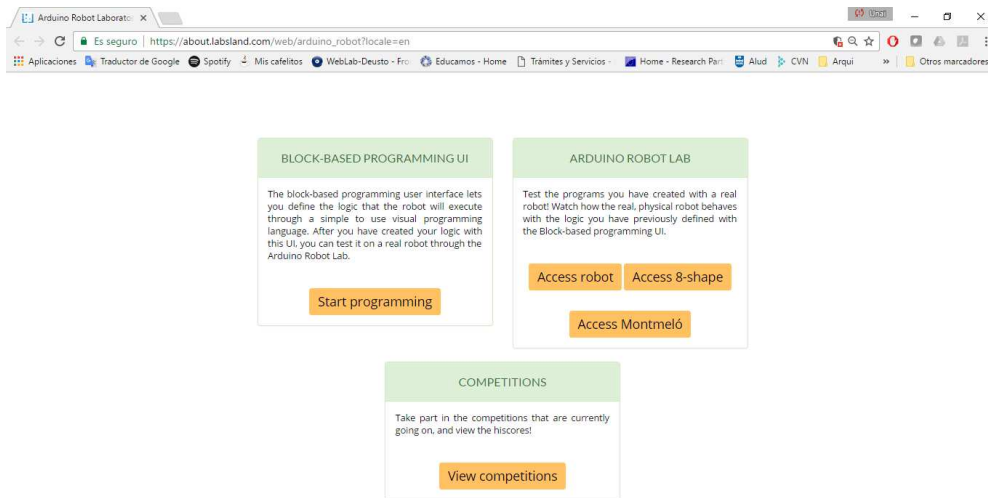
7. In the **Blocks-Based Programming Interface** users can stay all the time they want. To try the program you are creating you will first need to *validate* it: click the "validate" button. It should turn green, indicating that your program has no errors.
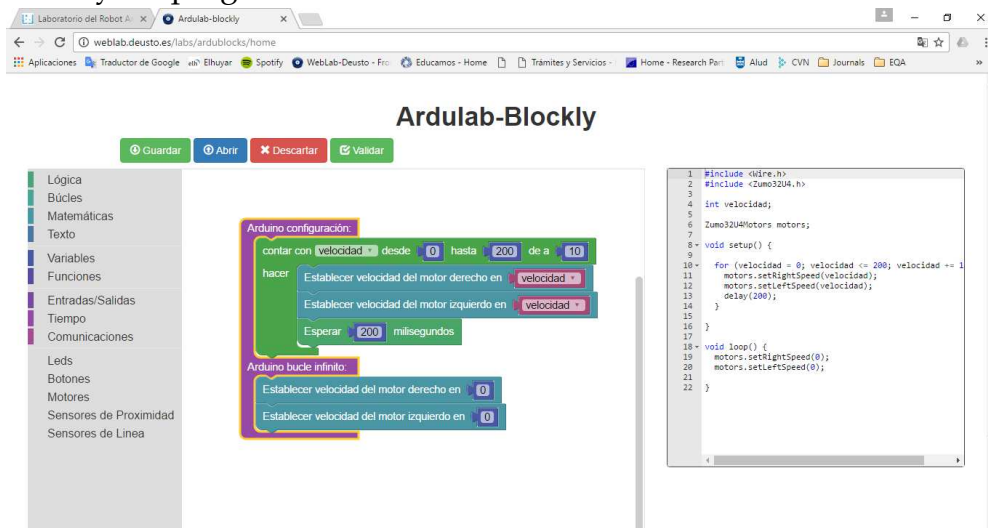
The programming environment is based on Blockly: a blocks-based system for building code visually. To the left of the interface we have the different block families, grouped in colors according to their
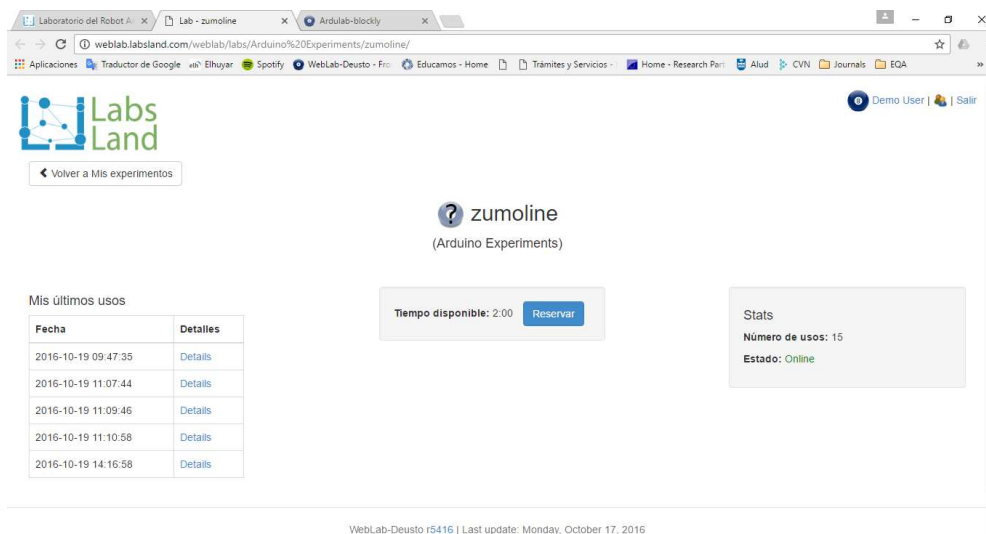
functionality. Thus, we will have blocks to add additional statements, loops, mathematical operations, or anything you may need.

In the middle part of the environment we will build our program, dragging the blocks from the left side. To delete the blocks, we can drag them to the paper bin icon, to the lower right. Alternatively, we can select it and use the "delete" key. In the rightmost we can see the equivalent C code.

In the upper part there is a series of buttons that will let us save the work we have done, load a previous work, or discard the program we are making. The "validate" button is used for verifying that the program we have created is indeed valid to be run in the robot.

Finally, when we want to finish our experiment, we will click on "finish" to return to the reserve page.
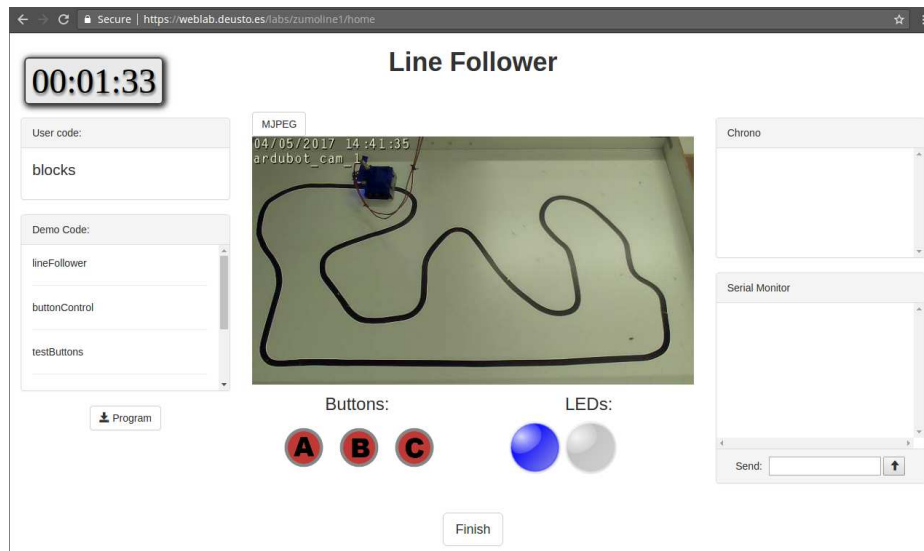
8. **Once it is validated, and no sooner,** you may access the experimenting interface with the real robot by clicking the "Arduino Robot Lab" button in Point 5's screen. You will see the next screen, where you will have to click "Reserve".

9. Once you click "reserve", the **real robot's interface** will be opened, as you can see in the following picture.

10. By default, in the current version, the program that was validated in Point 6 will be called "blocks". The user will need to select it and click the "Program" button. Then, the program that was just validated in Point 6 will be loaded in the robot. The user will have 2 minutes to use it. Once the time is over, the session will close.

Important: Because the program that "blocks" references is linked to the current user, which is currently "demo" for every user that accesses though LabsLand, for now it is advisable that only a single user accesses the experiment at once. Users who access through their own user will have no problem.

In the middle part of the interface we can see the robot while it runs the code that we have programmed. In the upper left screen, we see the time that we have left in the current reserve.

In the left most part, you can see the programs that you may load into the robot. In the upper block, you can see the list of programs we have made ourselves. In the lower block you can see pre-made demo programs that are designed to showcase the different functionalities of the robot. Below that block, there is a "program" button, through which we can program the robot with the selected program.

In the lower side of the interface we can see three red buttons, "A", "B", and "C", with which we will be able to interact with the robot. There are also two icons that represent the Robot's LEDs and that are lit when the real LEDs do.

To the right you can see a block that shows a chronometer. In the lower part, a block that monitors the serial communications with the robot.