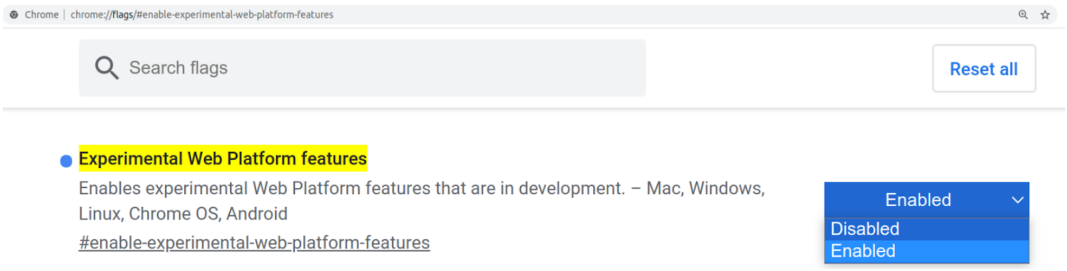
Collecting Data for Your Custom Magic Wand Project

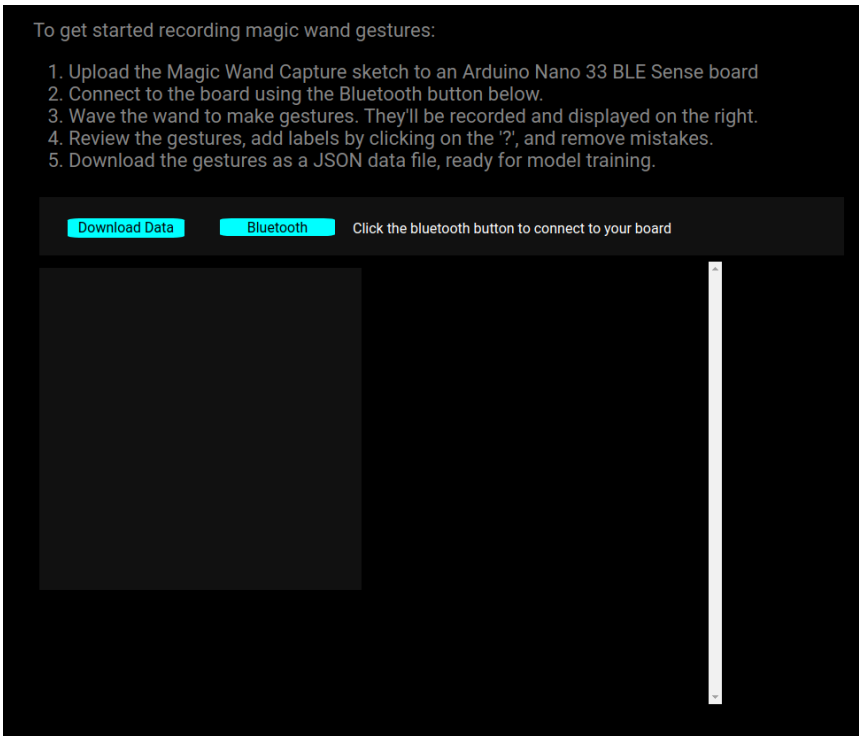
In this document we are going to collect custom gestures which we can then later use to train a custom magic wand project.

1. Make sure the default Magic Wand project is deployed as described in the previous reading!
2. Open up your browser and navigate to: https://tinymlx.org/magic_wand
    a. If you see a warning that says: `Error: This browser doesn't support Web Bluetooth. Try using Chrome.` If you are not using Chrome we suggest you switch to Chrome . If you are already using Chrome then navigate to the following and make sure to “enable” the “experimental web platform features.” We have found this step to be necessary on older versions of Chrome and users running the Linux operating system. `chrome://flags/#enable-experimental-web-platform-features`

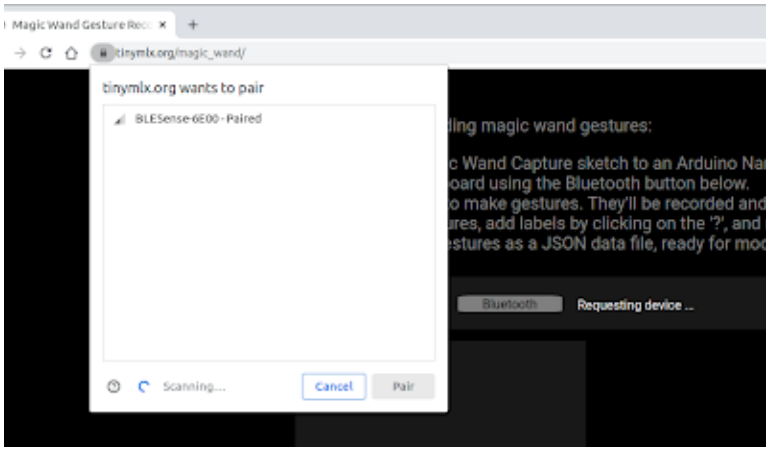


If this problem persists make sure you are navigating to `https://`. For some reason if you do not use the secure protocol then web bluetooth will not work.

b. You should then arrive at a webpage that looks something like the following:



3. You'll then need to connect your device over bluetooth. To do that simply click the blue bluetooth button and a pop-up will appear asking to pair. Select your BLE Sense which should be called something like "BLESense-XXXX" where XXXX will vary, and click the pair button. **Do note that the course staff has found that sometimes you have to repeat this step twice.** Once you are connected the bluetooth button will turn green.



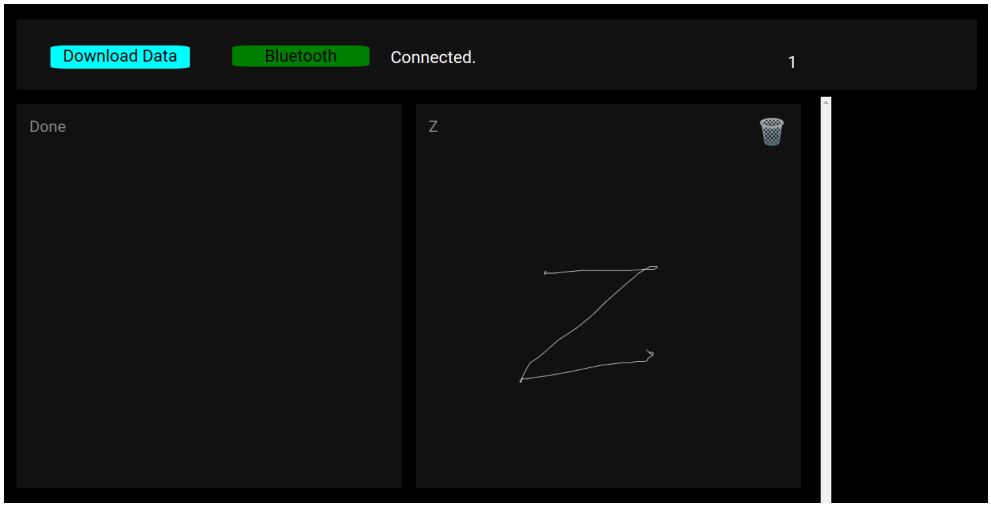
4. Once your Arduino is paired it's time to record some gestures. You'll notice that every time you move the Arduino around and then stop a new gesture is recorded. This is

because the gestures are automatically split up by times when the wand is kept still. These pauses act like spaces between words, and so when you've finished a gesture you should stop moving the wand so that it ends cleanly. **Note that the direction of the gesture matters** (e.g., a clockwise circle is different from a counterclockwise circle)!

These gestures you are drawing will start to show up in the list on the right side of the screen. You can look at the shapes shown there to understand whether the gestures came out cleanly. **A good rule of thumb is that if you can't tell what the gesture is by looking at it, then a model will have a hard time recognizing it too.** If you want to delete a recording simply click the trashcan icon at the top right of each gesture recording. (You may need to delete a lot of spurious recordings that were made as you moved the Arduino into position between each gesture).

Also make sure to label all of your gestures for training. You can label each recording by clicking on the question mark at the top left of each gesture and typing in your label. For example the screenshot below shows the label “Z” added to the gesture of the letter “Z” recorded by the course staff.

The staff has found that collecting ~20 examples each of 2-3 different gestures often will be enough data to successfully train a moderately decent magic wand application (i.e., it will work often for you may not generalize to other users). To help you keep track of how many gestures you recorded there is a number in the top right of the screen (e.g., the number 1 as shown in the image below). The staff has also found that gestures like a circle (O) or the (Z) for Zoro tend to work quite well! **Finally, you can upload multiple JSON files to the training script so don’t feel pressured to do all of your gesture recordings in one shot!**



5. When you are done collecting all of your data simply click the blue “Download Data” button and a JSON file with all of the gestures will be automatically downloaded! We’ll use that file in the Colab in the next section to train a custom model! **Be careful, when you leave or refresh the web page, your recorded gestures will be lost, so make sure you use the "Download Data" link to save them!**