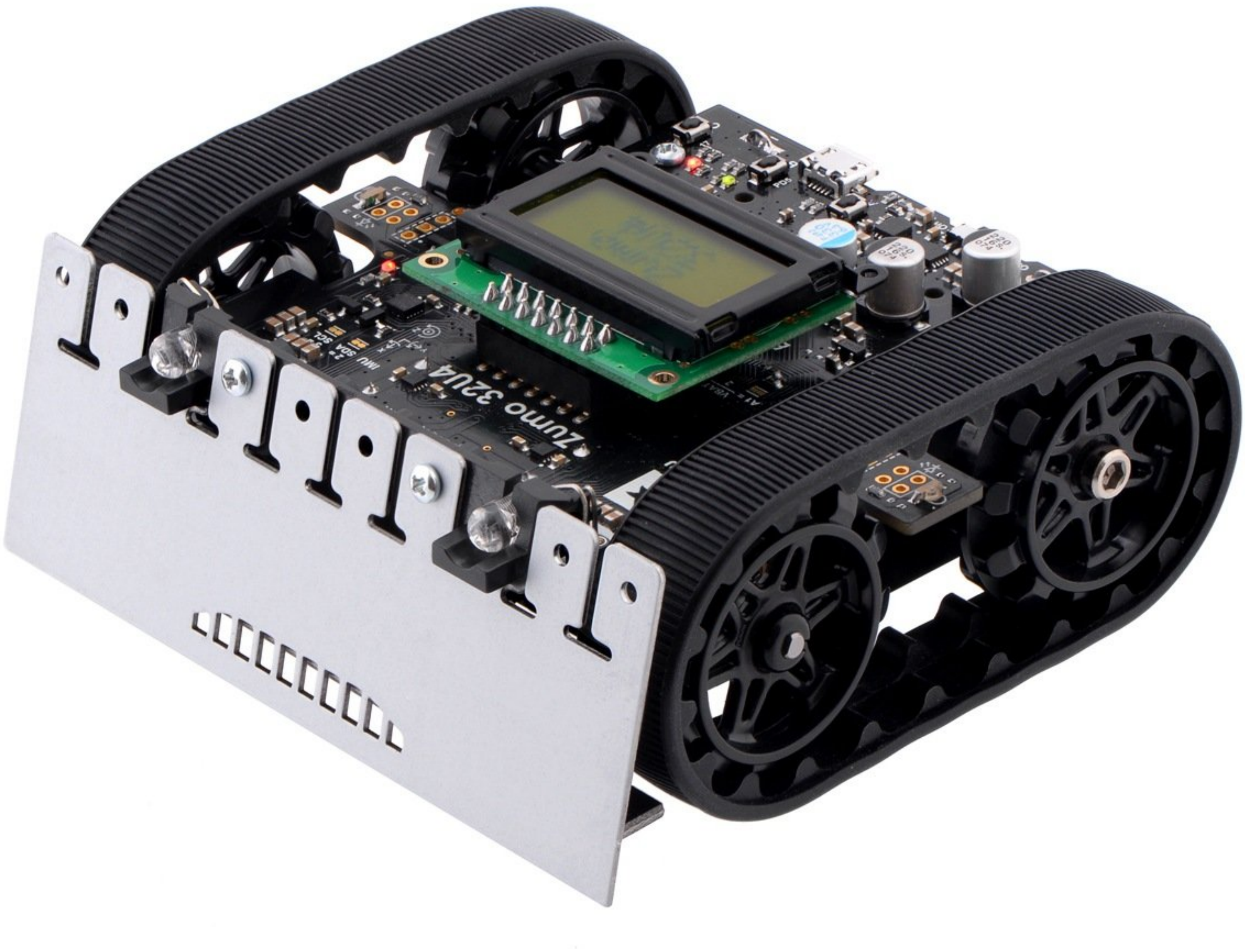
brandeismakerlab

Getting Started with Zumo Automation Project

This guide shows a user how to install all the software and libraries necessary to program a ZUMO32U4 robot with the Zumo automation project's libraries.

Written By: Jacob Smith



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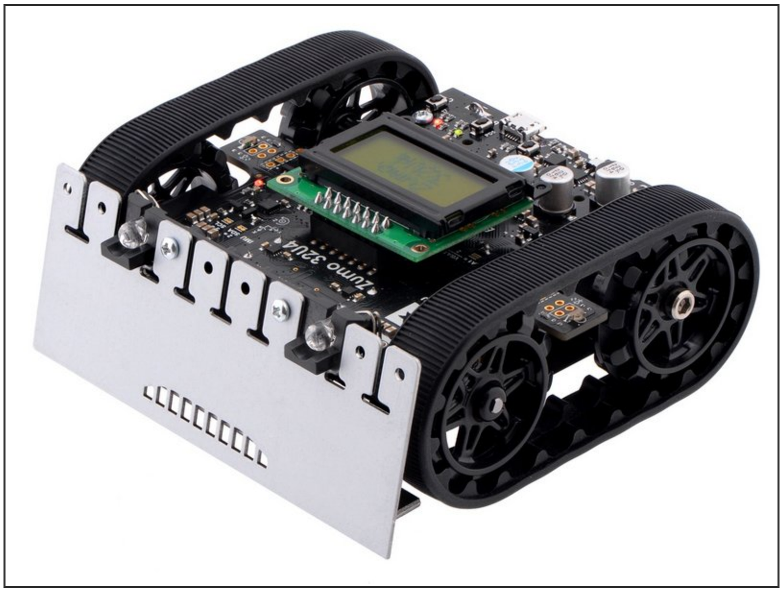
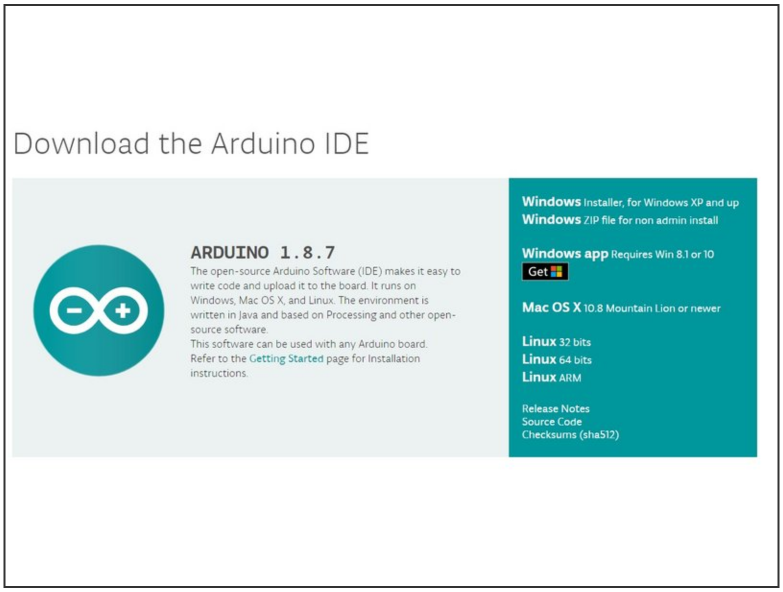
INTRODUCTION

This guide is intended for makerlab members who want to contribute to the Zumo automation project. The software that will be installed is Arduino IDE to program robot and github desktop to handle editing the project.

Step 1 — Download Arduino





Download the Arduino IDE

ARDUINO 1.8.7

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.
This software can be used with any Arduino board.
Refer to the Getting Started page for Installation instructions.

Windows Installer, for Windows XP and up
Windows ZIP file for non admin install

Windows app Requires Win 8.1 or 10
Get

Mac OS X 10.8 Mountain Lion or newer

Linux 32 bits
Linux 64 bits
Linux ARM

Release Notes
Source Code
Checksums (sha512)

- Go to https://www.pololu.com/docs/0J63/5.2 to download arduino and configure it to work with the ZUMO32U4 robot
- This will give you an integrated development enviornment to write programs, compile them, and download them to the ZUMO32U4 robot

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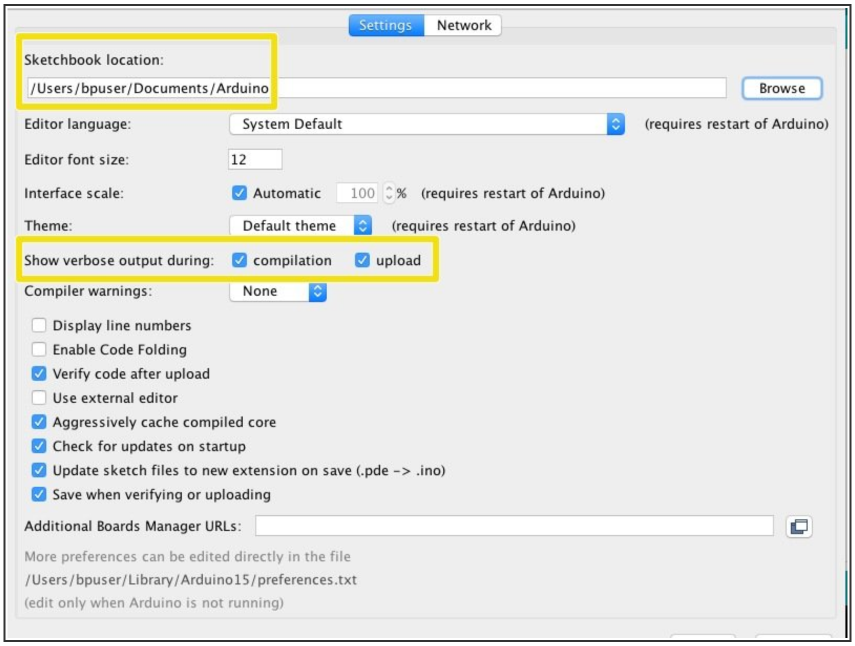
Step 2 — Arduino Preferences



Sketchbook location:
/Users/bpuser/Documents/Arduino

Editor language: System Default (requires restart of Arduino)

Editor font size: 12

Interface scale: ☑ Automatic 100 % (requires restart of Arduino)

Theme: Default theme (requires restart of Arduino)

Show verbose output during: ☑ compilation ☑ upload

Compiler warnings: None

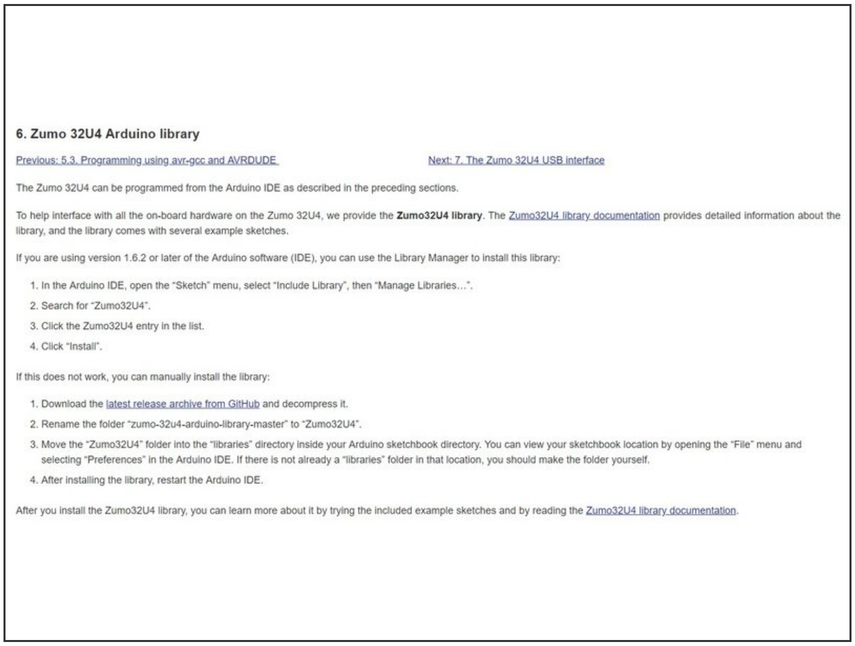
☐ Display line numbers
☐ Enable Code Folding
☑ Verify code after upload
☐ Use external editor
☑ Aggressively cache compiled core
☑ Check for updates on startup
☑ Update sketch files to new extension on save (.pde -> .ino)
☑ Save when verifying or uploading

Additional Boards Manager URLs:

More preferences can be edited directly in the file
/Users/bpuser/Library/Arduino15/preferences.txt
(edit only when Arduino is not running)

- Go to arduino-->preferences to reach this window
- First, click to show verbose output under compilation and upload. This gives us more information about what's going in in case the code doesn't compile or the download doesn't work
- Finally, note the sketchbook location. This is where arduino looks for its code database and where it saves projects to. The folder contains a subfolder called libraries, which is where the project will go.

Step 3 — Install Manufacturer's library for Zumo32U4 robot



6. Zumo 32U4 Arduino library

Previous: 5.3. Programming using avr-gcc and AVRDUDE Next: 7. The Zumo 32U4 USB interface

The Zumo 32U4 can be programmed from the Arduino IDE as described in the preceding sections.

To help interface with all the on-board hardware on the Zumo 32U4, we provide the **Zumo32U4 library**. The Zumo32U4 library documentation provides detailed information about the library, and the library comes with several example sketches.

If you are using version 1.6.2 or later of the Arduino software (IDE), you can use the Library Manager to install this library:

1. In the Arduino IDE, open the “Sketch” menu, select “Include Library”, then “Manage Libraries…”.
2. Search for “Zumo32U4”.
3. Click the Zumo32U4 entry in the list.
4. Click “Install”.

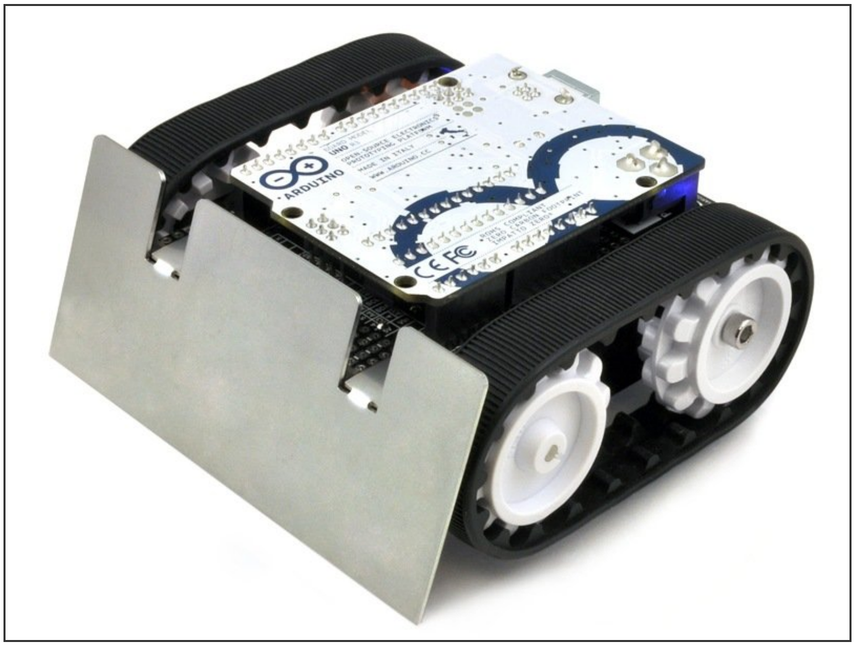
If this does not work, you can manually install the library:

1. Download the latest release archive from GitHub and decompress it.
2. Rename the folder “zumo-32u4-arduino-library-master” to “Zumo32U4”.
3. Move the “Zumo32U4” folder into the “libraries” directory inside your Arduino sketchbook directory. You can view your sketchbook location by opening the “File” menu and selecting “Preferences” in the Arduino IDE. If there is not already a “libraries” folder in that location, you should make the folder yourself.
4. After installing the library, restart the Arduino IDE.

After you install the Zumo32U4 library, you can learn more about it by trying the included example sketches and by reading the Zumo32U4 library documentation.

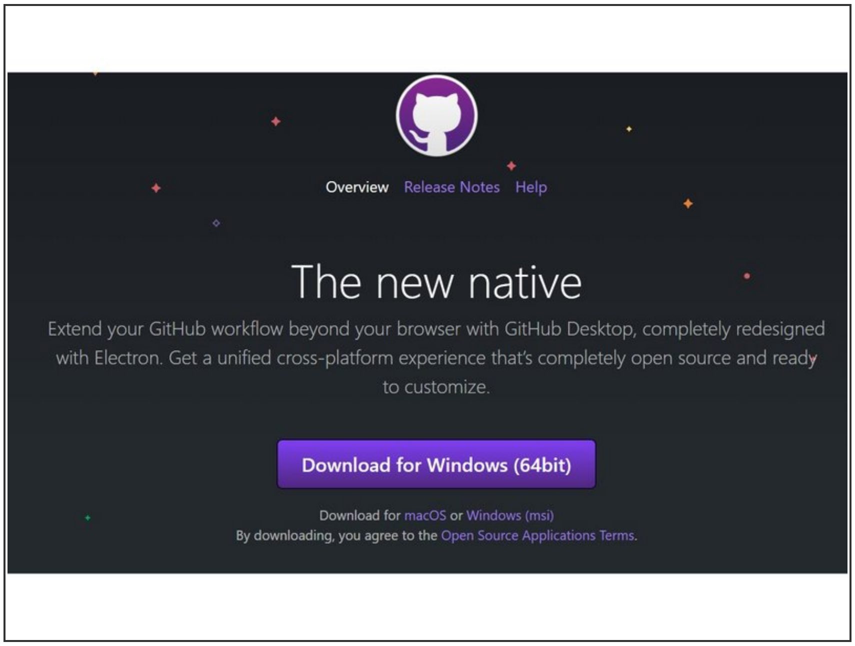
- Go to https://www.pololu.com/docs/0J63/6 and follow the guide there to install pololus' library, which our code needs to actually get the robot's sensor values and tell it to move

Step 4 — Install Manufacturer's library for Zumo shield robot



- The other robot our project uses is the Zumo shield for arduino
- Go to https://www.pololu.com/docs/0J57/6 and follow the instructions to install the Zumo Shield library

Step 5 — Install Github Desktop



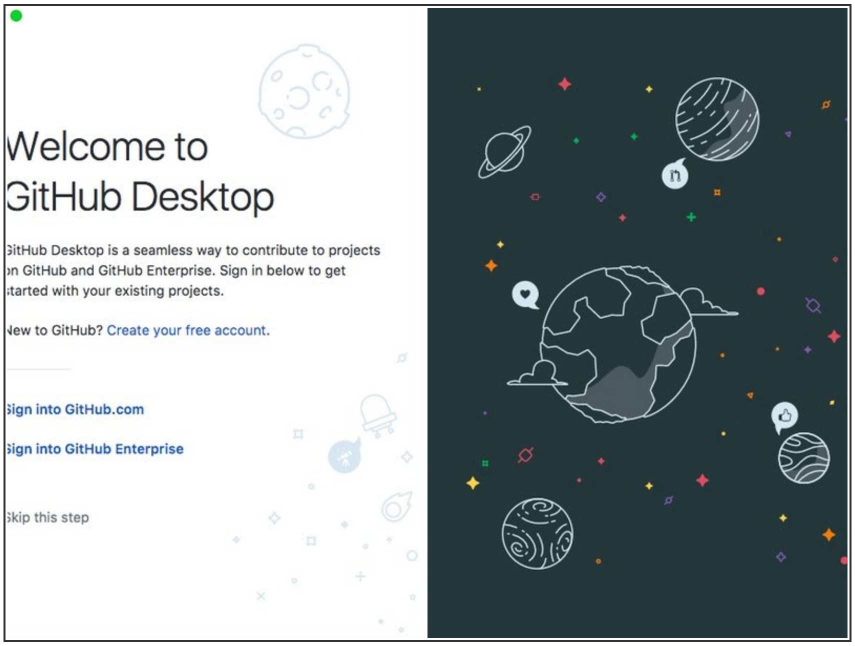
The new native

Extend your GitHub workflow beyond your browser with GitHub Desktop, completely redesigned with Electron. Get a unified cross-platform experience that's completely open source and ready to customize.

Download for macOS or Windows (msi)
By downloading, you agree to the Open Source Applications Terms.

- Github Desktop allows us to edit the Zumo automation project together, and all changes can be updated to everyone else's copy
- Go to https://desktop.github.com/ and download github desktop

Step 6 — Sign in to github Desktop



Welcome to GitHub Desktop

GitHub Desktop is a seamless way to contribute to projects on GitHub and GitHub Enterprise. Sign in below to get started with your existing projects.

New to GitHub? Create your free account.

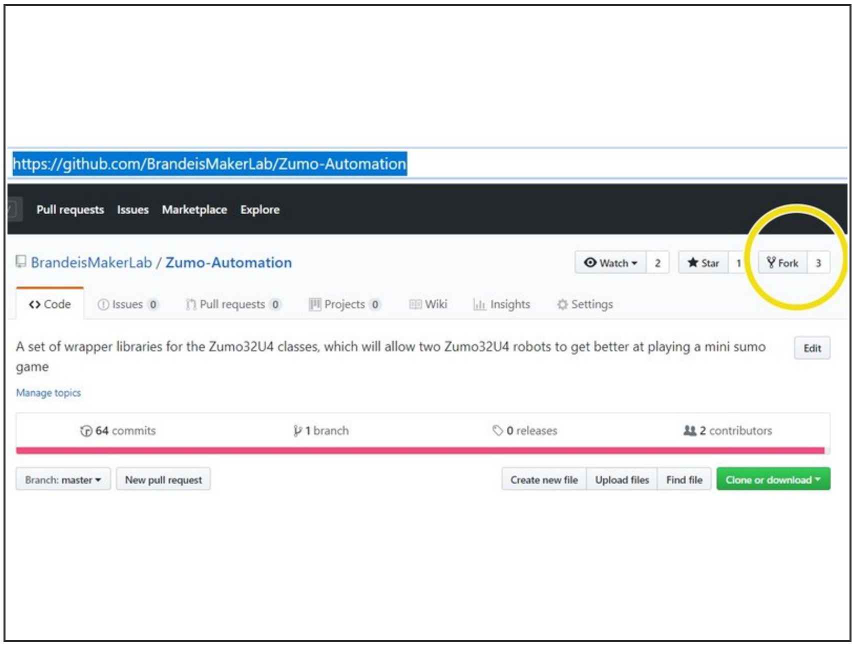
Sign into GitHub.com

Sign into GitHub Enterprise

Skip this step

- Now, sign in to github desktop

Step 7 — Forking a github project



https://github.com/BrandeisMakerLab/Zumo-Automation

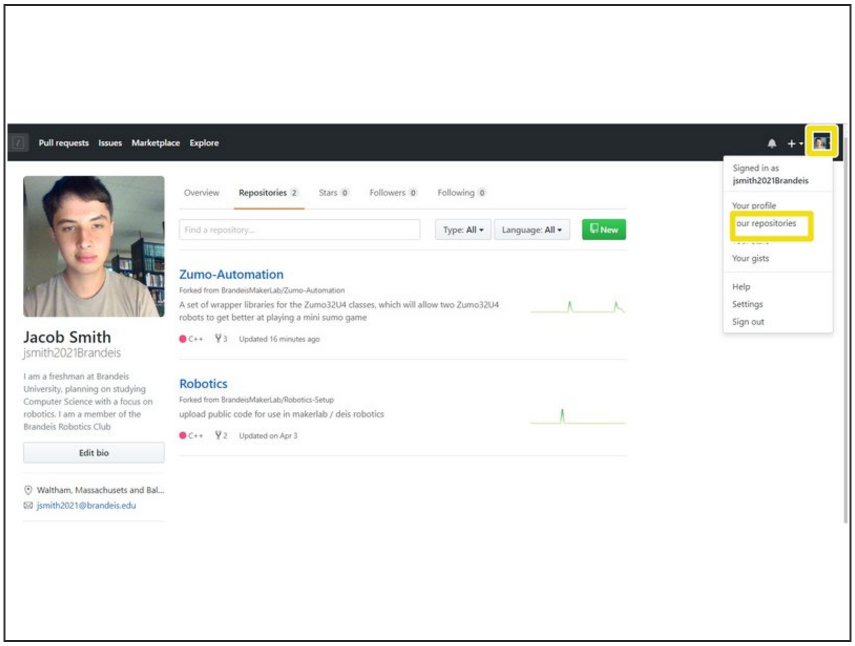
BrandeisMakerLab / Zumo-Automation

A set of wrapper libraries for the Zumo32U4 classes, which will allow two Zumo32U4 robots to get better at playing a mini sumo game

64 commits | 1 branch | 0 releases | 2 contributors

- Log in to github.com, if you don't have an account, create one
- Go to https://github.com/BrandeisMakerLab/Zumo...
- Click the box that says fork to create your own copy of the project

Step 8 — Finding your forked project



Jacob Smith
jsmith2021Brandeis

I am a freshman at Brandeis University, planning on studying Computer Science with a focus on robotics. I am a member of the Brandeis Robotics Club

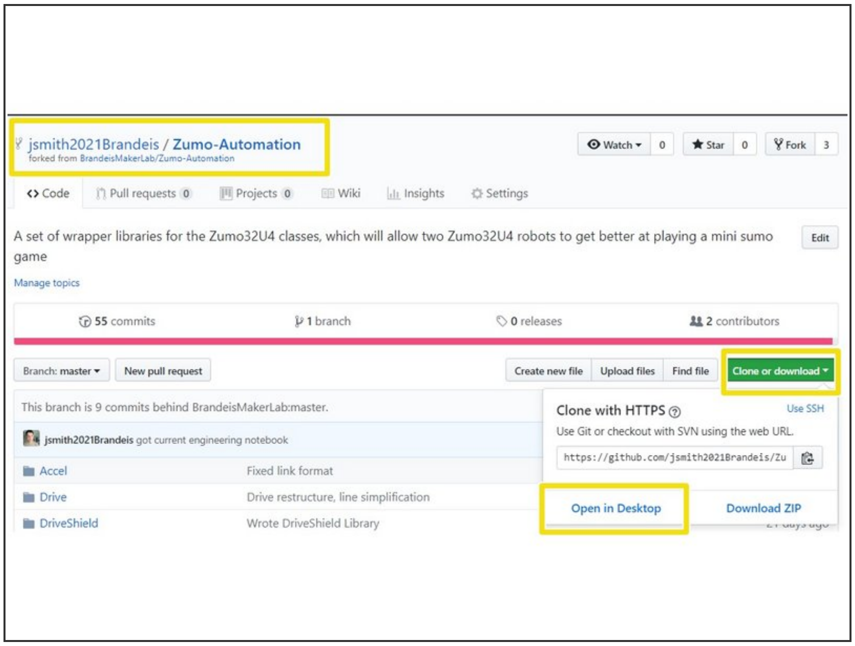
Waltham, Massachusets and Bal...
jsmith2021@brandeis.edu

Zumo-Automation
Forked from BrandeisMakerLab/Zumo-Automation
A set of wrapper libraries for the Zumo32U4 classes, which will allow two Zumo32U4 robots to get better at playing a mini sumo game
C++ 3 Updated 16 minutes ago

Robotics
Forked from BrandeisMakerLab/Robotics-Setup
upload public code for use in makerlab / deis robotics
C++ 2 Updated on Apr 3

- Whenever you are signed in to github online, you can click on your profile picture and then repositories to see the repositories you own
- Notice that your copy of Zumo-automation is present, click on it

Step 9 — Download your forked copy of project



jsmith2021Brandeis / Zumo-Automation
forked from BrandeisMakerLab/Zumo-Automation

A set of wrapper libraries for the Zumo32U4 classes, which will allow two Zumo32U4 robots to get better at playing a mini sumo game

55 commits 1 branch 0 releases 2 contributors

This branch is 9 commits behind BrandeisMakerLab:master.

jsmith2021Brandeis got current engineering notebook

Accel	Fixed link format
Drive	Drive restructure, line simplification
DriveShield	Wrote DriveShield Library

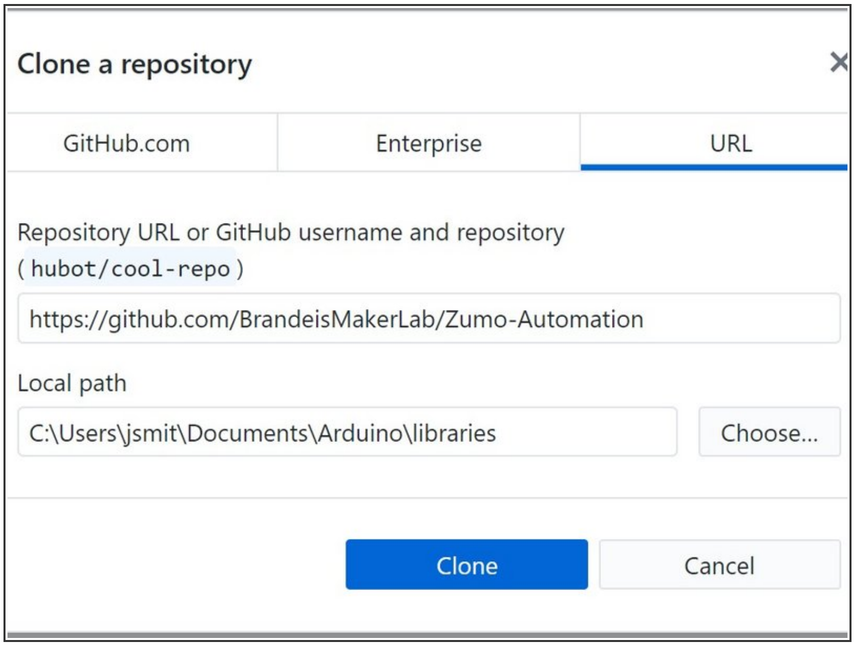
Clone with HTTPS

Use Git or checkout with SVN using the web URL.

`https://github.com/jsmith2021Brandeis/Zu`

- In your forked copy of the project, click clone or download, then open in github desktop.
- This creates a copy of the Zumo automation project on your computer, which can be updated to the central location on github.com by an administrator

Step 10 — Downloading Forked Project continued



Clone a repository

Repository URL or GitHub username and repository (hubot/cool-repo)

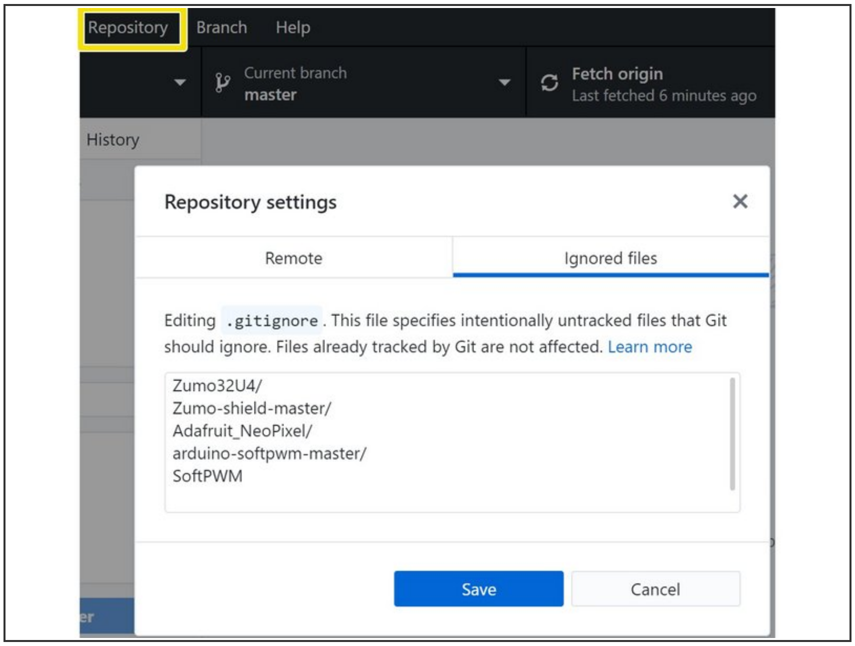
https://github.com/BrandeisMakerLab/Zumo-Automation

Local path

C:\Users\jsmit\Documents\Arduino\libraries

- In the window that pops up, the first box will be filled in.
- The second box is where the project will be stored on your computer. Make it the library folder of arduino. for me, it would be C:\Users\jsmit\Documents\Arduino\libraries
- But you can check in arduino--> preferences as in at beginning of tutorial
- Now, we have an active zumo project that can be updated to github easily!

Step 11 — Ignoring other library folders in github project



Repository settings

Editing .gitignore. This file specifies intentionally untracked files that Git should ignore. Files already tracked by Git are not affected. Learn more

```
Zumo32U4/
Zumo-shield-master/
Adafruit_NeoPixel/
arduino-softpwm-master/
SoftPWM
```

- In order to stop github from uploading those files, click repositories in github desktop -->settings-->ignored files, and add the filenames of anything you don't want to be part of the github project

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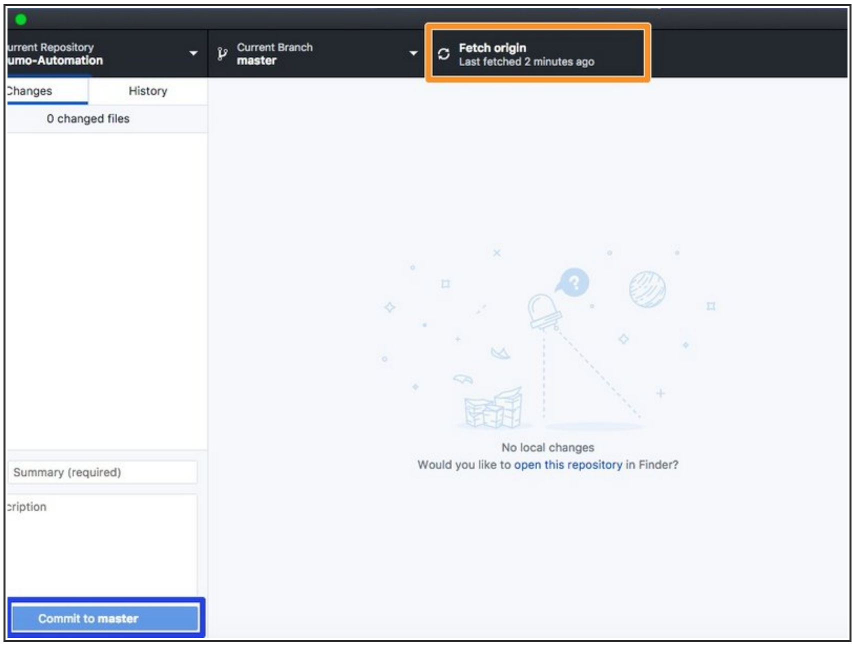
Step 12 — Now you can update the project!



- This is what the github desktop window looks like once you have imported a project. Any changes you make to the libraries folder will now be shown on the left, and you can commit them with the blue commit to master button
- Then, you can push changes to your copy of the project online with the orange button, which will allow you to push changes if there are any

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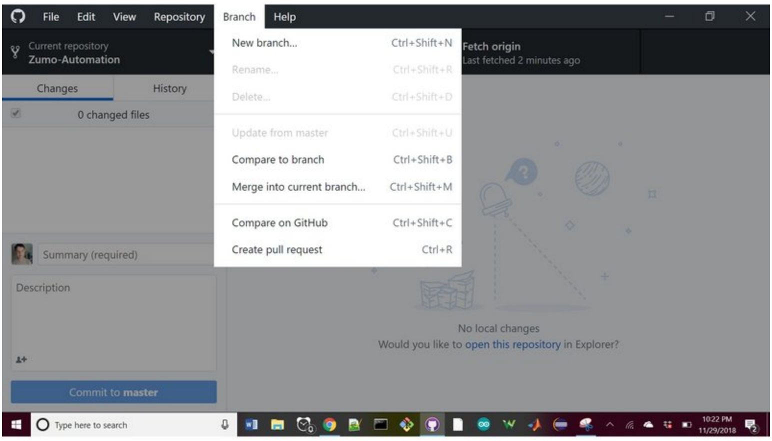
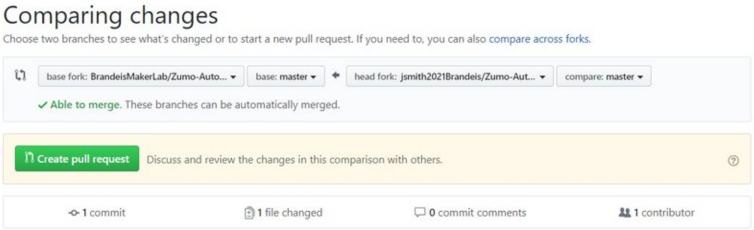
Step 13 — Pull Requests



No local changes

Would you like to open this repository in Explorer?


Comparing changes

Choose two branches to see what's changed or to start a new pull request. If you need to, you can also compare across forks.

base fork: BrandeisMakerLab/Zumo-Auto...
base: master
head fork: jsmith2021Brandeis/Zumo-Aut...
compare: master

✓ Able to merge. These branches can be automatically merged.

Discuss and review the changes in this comparison with others.

- When you want your project changes to be updated to the main project, click branch--> create pull request in github desktop
- This will take you to github.com (makre sure you are signed in), where you can click to create the pull request
- Then, an administrator will review your pull request and merge it into the main project if we like it!

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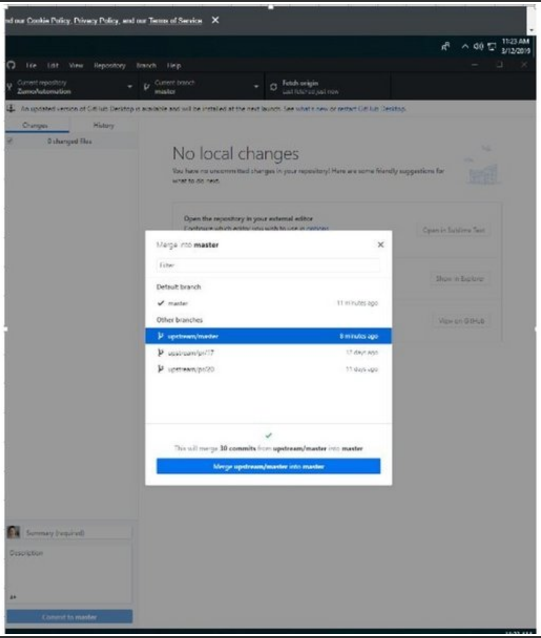
Step 14 — To Sync with Main Project



No local changes

You have no uncommitted changes in your repository! Here are some friendly suggestions for what to do next.

An updated version of GitHub Desktop is available and will be installed at the next launch. See what's new or restart GitHub Desktop.

This will merge 10 commits from upstream/master into master

- With multiple people contributing to the master project, you need to sync your forked copy with the project
- "To sync the master of your fork to the master of the original repository using GitHub Desktop: Click on the 'current branch' tab and first select 'master' as the current branch (if it's not already selected). Click on the 'fetch origin' button.
- Click on the 'current branch' tab again and click the 'choose a branch to merge into master' button at the bottom. *NOTE: Looking down this list, you will find 2 entries for every branch. Those that are prefixed with origin/ are the branches in your fork, and those prefixed with upstream/ are those in the original repository on GitHub.
- Select upstream/master from this list, and this pull the changes down from the master repository to bring your local clone up to date. Once you local clone has finished pulling the updates from the master repo, push these new changes to your fork, stored on GitHub, using the push origin button on GitHub desktop."
- Quoted from: https://stackoverflow.com/questions/4611... March 12 2019

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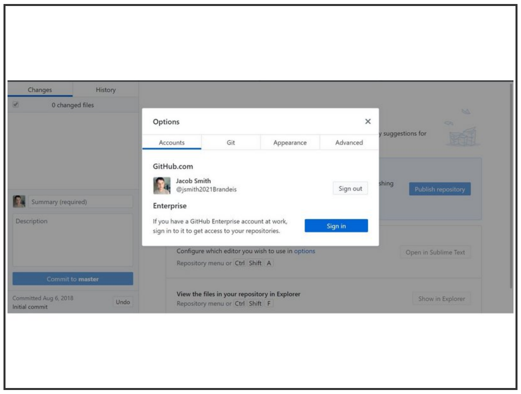
Step 15 — To Sign in and out of Github



GitHub.com

Jacob Smith
@jsmith2021Brandeis

Enterprise

If you have a GitHub Enterprise account at work, sign in to it to get access to your repositories.

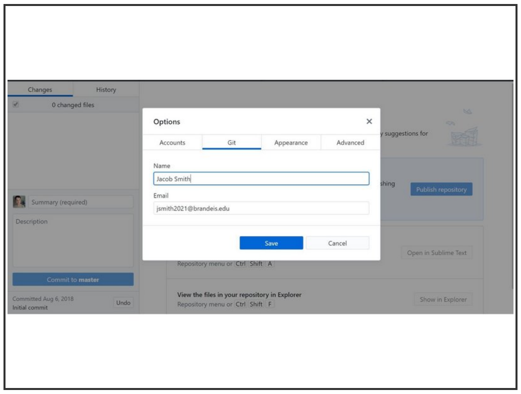
Configure which editor you wish to use in options

Repository menu or Ctrl Shift A

View the files in your repository in Explorer

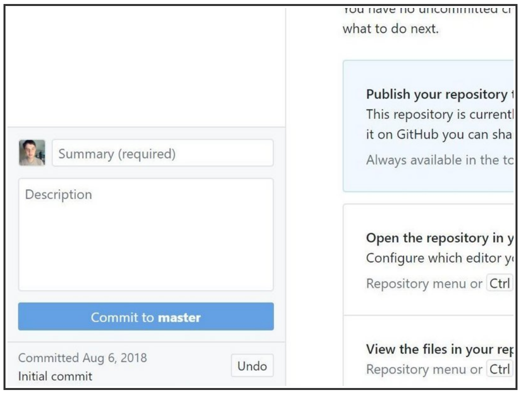
Repository menu or Ctrl Shift F

Committed Aug 6, 2018
Initial commit



Name: Jacob Smith

Email: jsmith2021@brandeis.edu



You have no uncommitted ch
what to do next.

Publish your repository t
This repository is currentl
it on GitHub you can sha
Always available in the to

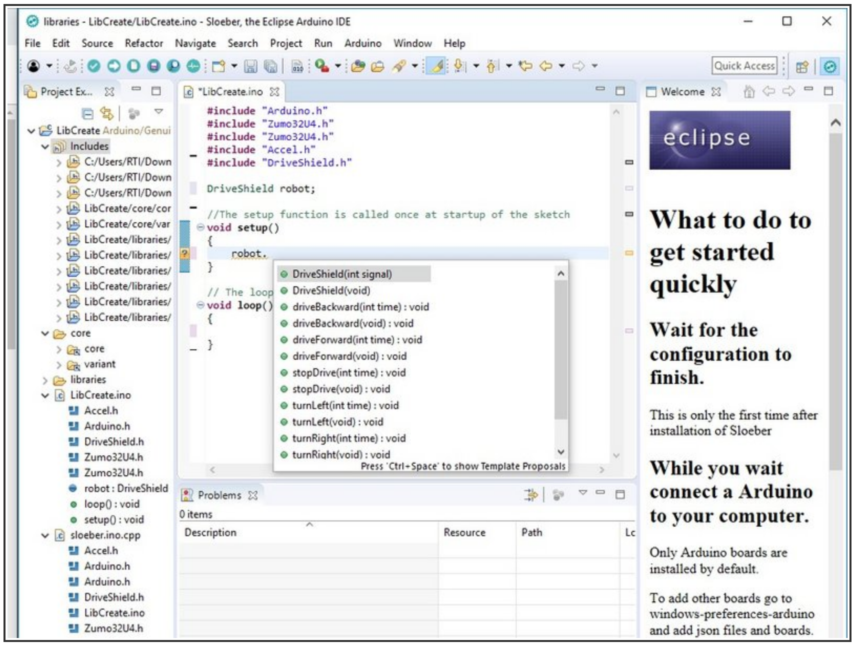
Open the repository in y
Configure which editor yo
Repository menu or

View the files in your rep
Repository menu or

Committed Aug 6, 2018
Initial commit

- To sign in and out o github desktop, go to file --> options
- In the Accounts Tab, enter your github account information
- In the Git Tab, also enter your account information
- See the explanation of why signing in and out is complicated

Step 16 — To edit Libraries



libraries - LibCreate/LibCreate.ino - Sloeber, the Eclipse Arduino IDE

```
#include "Arduino.h"
#include "Zumo32U4.h"
#include "Zumo32U4.h"
#include "Accel.h"
#include "DriveShield.h"

DriveShield robot;

//The setup function is called once at startup of the sketch
void setup()
{
	robot.
}

// The loop
void loop()
{

}
```

Problems
0 items

Description	Resource	Path	Lc

What to do to get started quickly

Wait for the configuration to finish.

This is only the first time after installation of Sloeber

While you wait connect a Arduino to your computer.

Only Arduino boards are installed by default.

To add other boards go to windows-preferences-arduino and add json files and boards.

- To edit Readme files in github, we use Typora
- To write background libraries, we use Sloeber
- How to Create a class in Slober
- Above tutorial has pictures, but to be able to access libraries, you need to click windows->preferences and click on Arduino
- Also, the private library path window had slashes wrong for windows, so add the path yourself
- The advantage of this software is you can set multiple source folders to store libraries, so you can have multiple github projects.

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