Megamark Unity 2017 Setup Guide

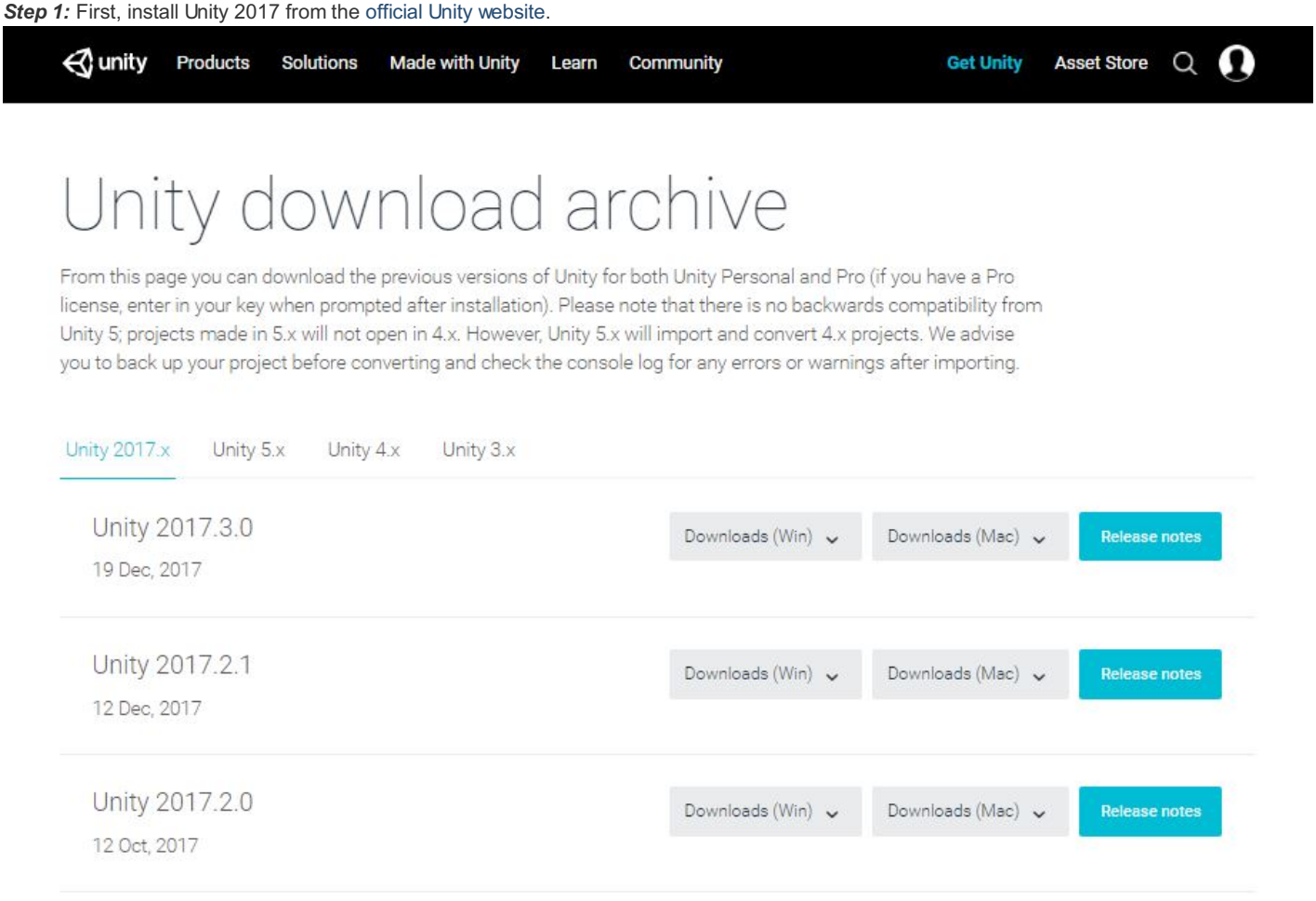
Unity is a very popular and powerful cross-platform game engine developed by Unity Technologies, which is primarily used to develop both 3 dimensional and 2 dimensional video games and simulations for computers, consoles, and mobile devices. At its core, the Choitek Megamark has an Arduino Mega 2560 microcontroller, which can be controlled by issuing serial commands via USB cable connected to a Mac, Windows, or Linux laptop computer running Unity projects. This tutorial will show you how to set up core Unity software and the Megamark Libraries to work with the Choitek Megamark Robot Platform.

The logo of Unity, used to represent the company as well as the Unity Editor. Used with permission.

Downloading and Installing Unity 2017

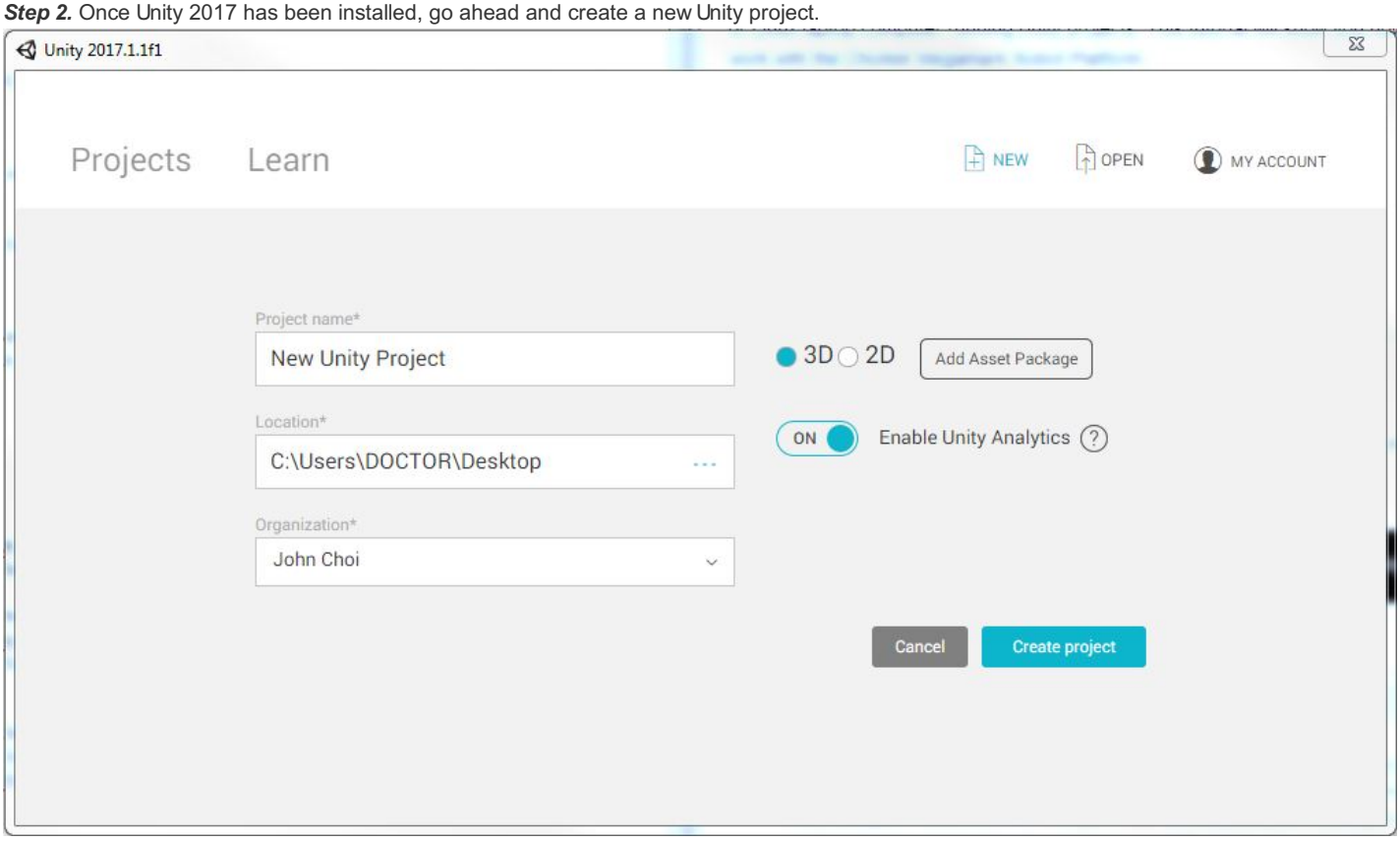
*Note that this guide is intended for use with **Unity version 2017.2**. It may or may not be fully compatible with other versions of Unity.*

Step 1: First, install Unity 2017 from the official Unity website.



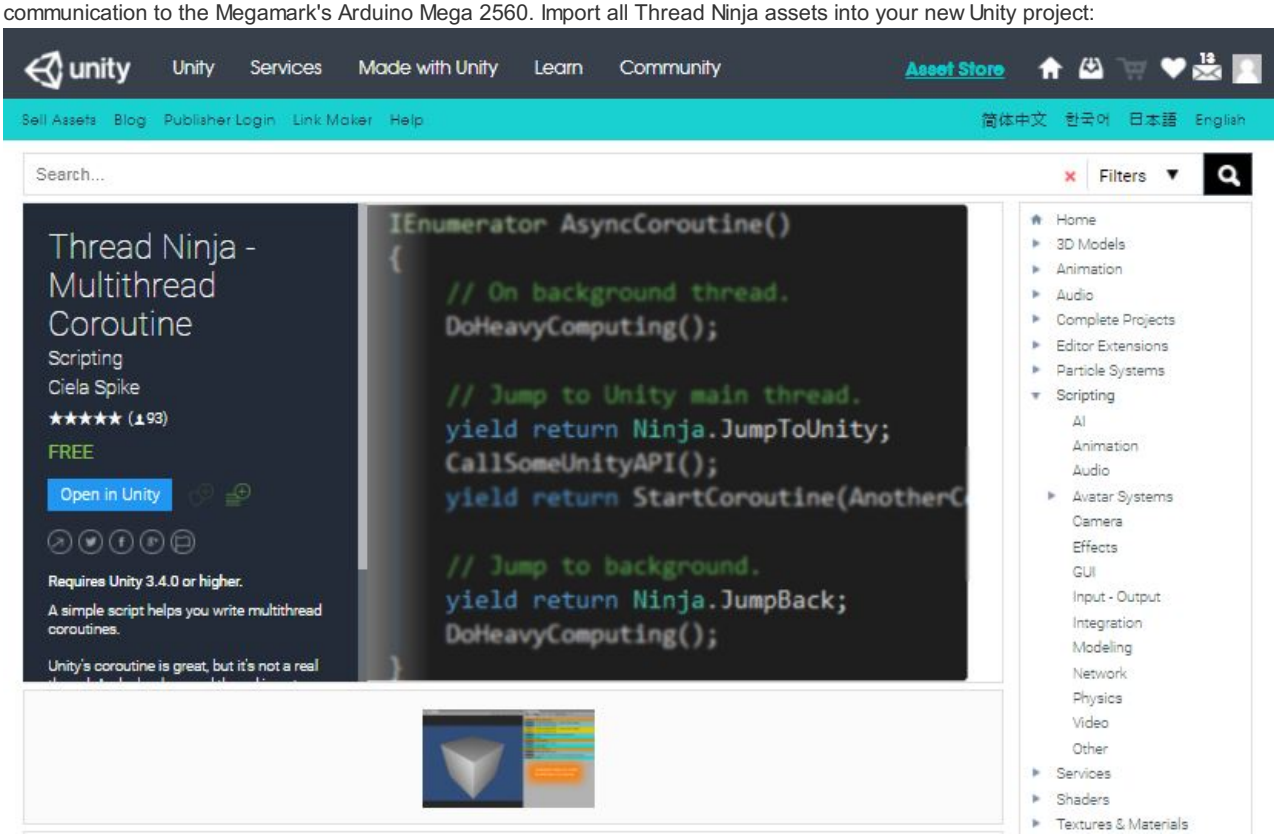
NOTE: If for any reason the 2017 version is no longer available on the main page and future versions do not work, you can download previous versions of Unity here.

Step 2. Once Unity 2017 has been installed, go ahead and create a new Unity project.

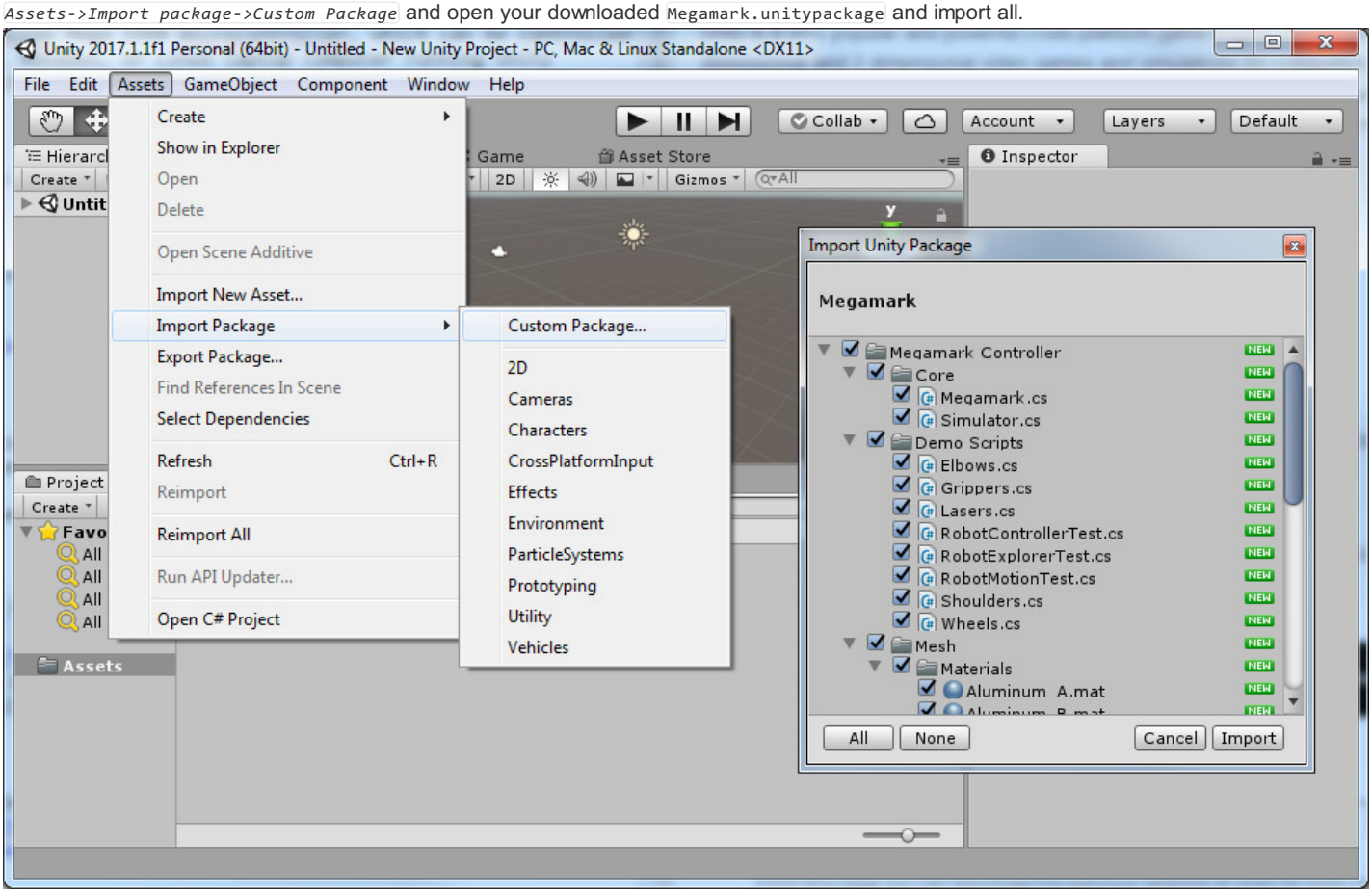


Name it whatever you want, and be sure to select `3D mode`.

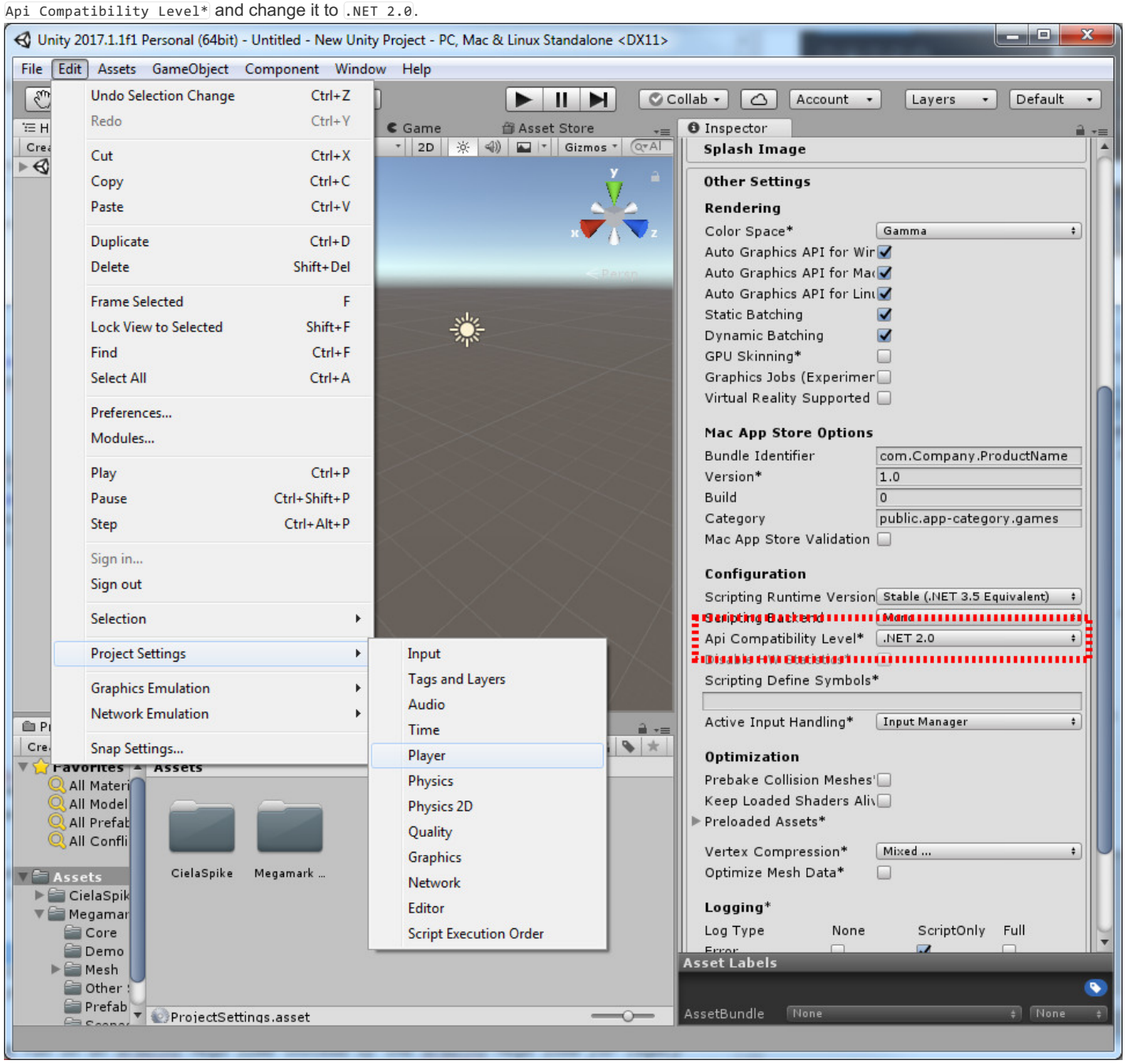
Step 3. Go to the **Unity Asset Store** and download Thread Ninja - Multithread Coroutine from *Ciela Spike*. This is needed for asynchronous serial communication to the Megamark's Arduino Mega 2560. Import all Thread Ninja assets into your new Unity project:



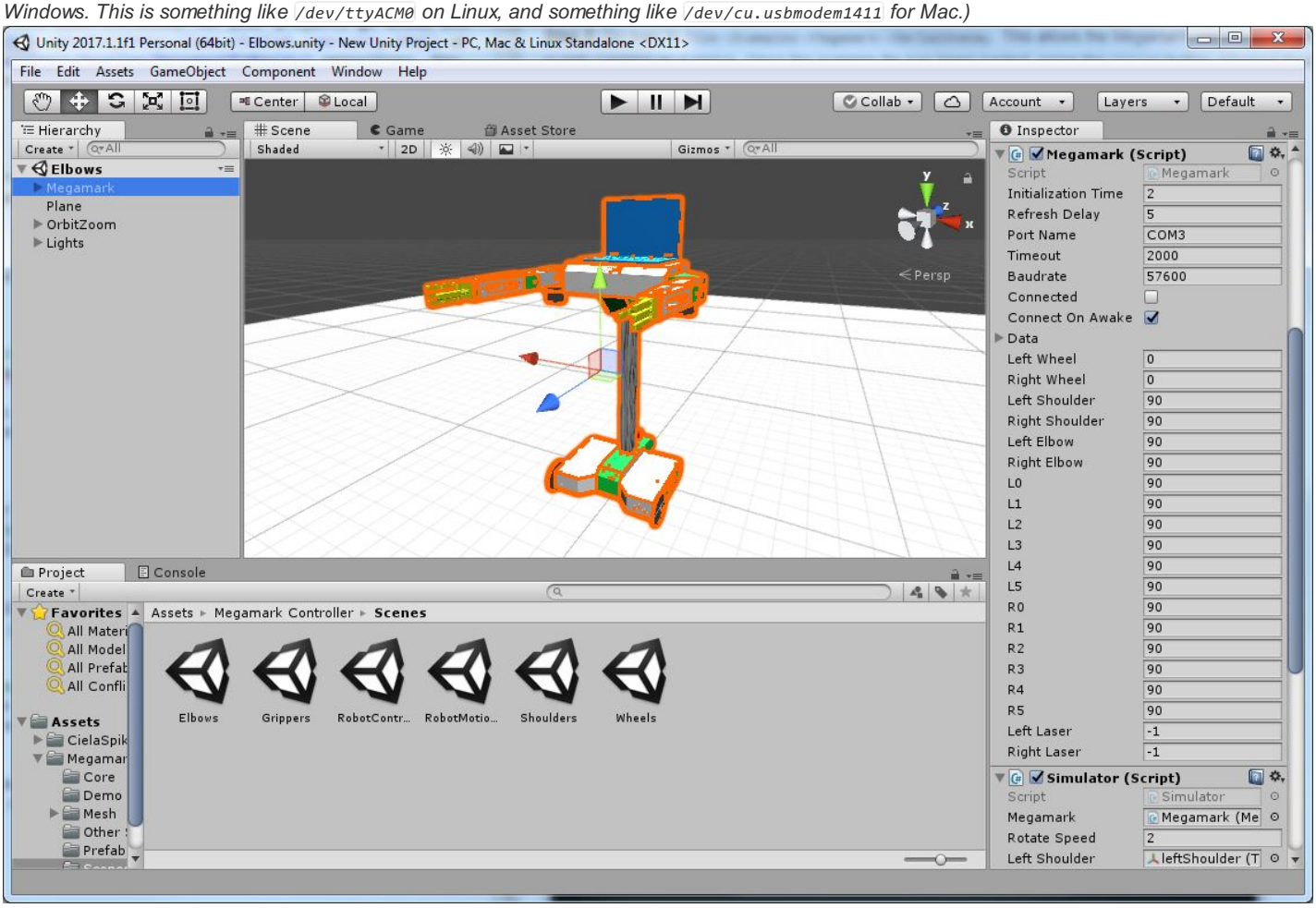
Step 4: Once Unity 2017 and Ciela Spike's *Thread Ninja* have been installed for your project, go ahead and download the `Megamark.unitypackage` from either the main Choitek website or the Github repository. Now, inside of the main Unity Window, go to `Assets->Import package->Custom Package` and open your downloaded `Megamark.unitypackage` and import all.



Step 5: Now, inside the main Unity Window, go to `Edit->Project Settings->Player`. On the right hand **Inspector** pane, look for `Api Compatibility Level*` and change it to `.NET 2.0`.



Step 6: Once you've completed the above steps, Unity should now be fully configured and ready to control the Choitek Megamark robot. To play an example, go to the **Project** pane and open up **Elbows.unity** in `Assets->Megamark Controller->Scenes`. Select the `Megamark` gameObject in the **Hierarchy** and change the `Port Name` variable to the COM Port of the attached robot's Arduino Mega 2560 *(Normally, this would be `COM3` on Windows. This is something like `/dev/ttyACM0` on Linux, and something like `/dev/cu.usbmodem1411` for Mac.)*

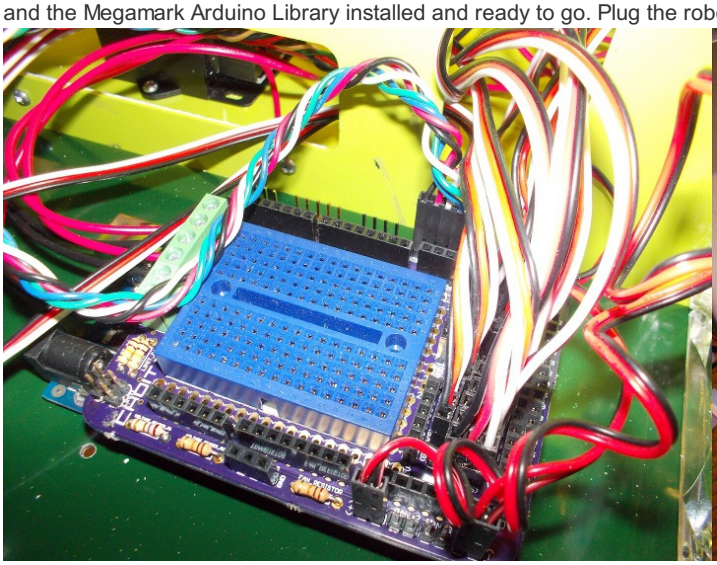


NOTE: On Windows, Unity .NET C# only accepts port names ranging from COM1 to COM9. If you have not yet prepared the robot's Arduino Mega 2560, please follow the additional Arduino setup instructions below:

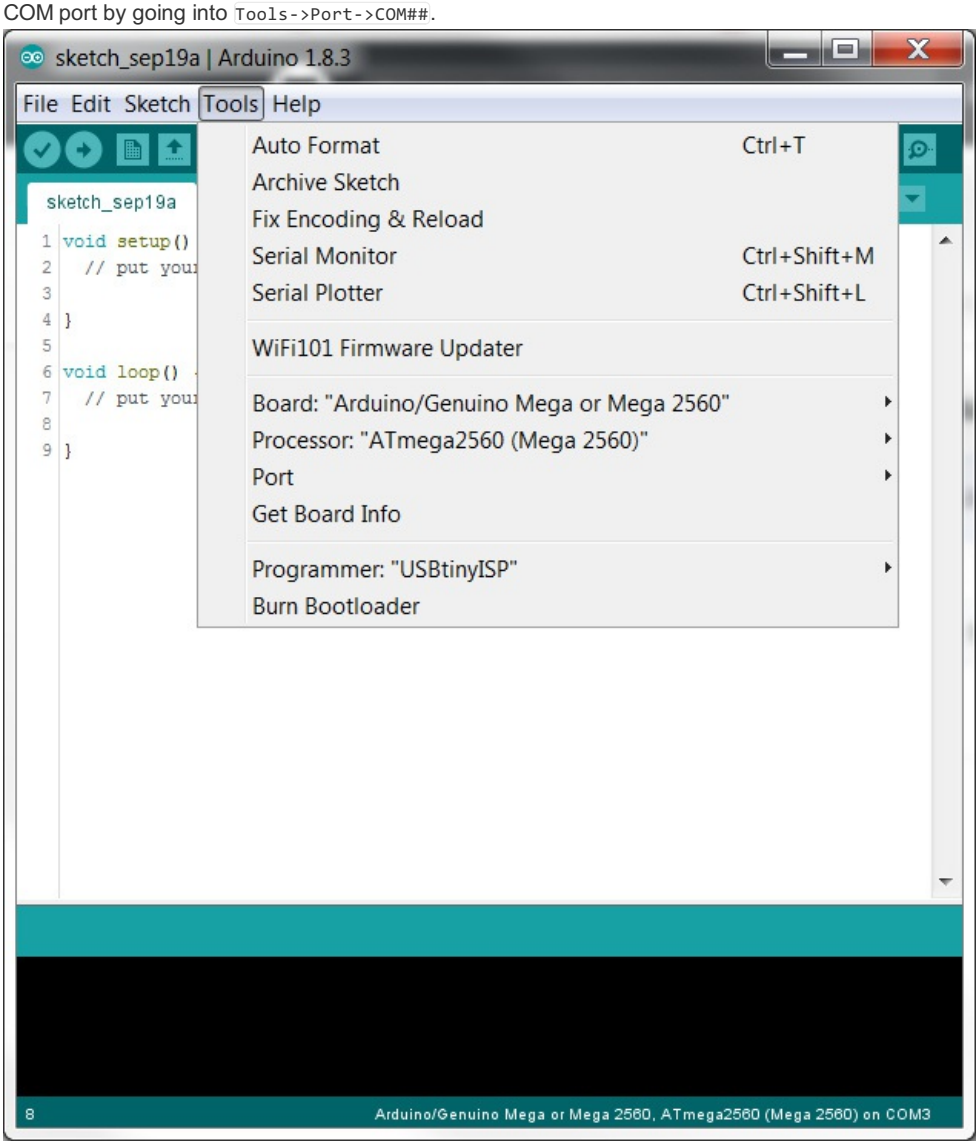
Downloading and Installing the Arduino Firmware

Once you have successfully installed **Unity 2017**, `Thread Ninja` and `Megamark.unitypackage` in the above steps, we can now prepare the firmware on the Choitek's Megamark's Arduino Mega 2560 board.

Step 1: If you have not done so already, follow the steps in the ***Megamark Arduino Setup Guide*** and make sure you have the Arduino software and the Megamark Arduino Library installed and ready to go. Plug the robot's internal Arduino Mega 2560 onto your laptop via USB Serial.

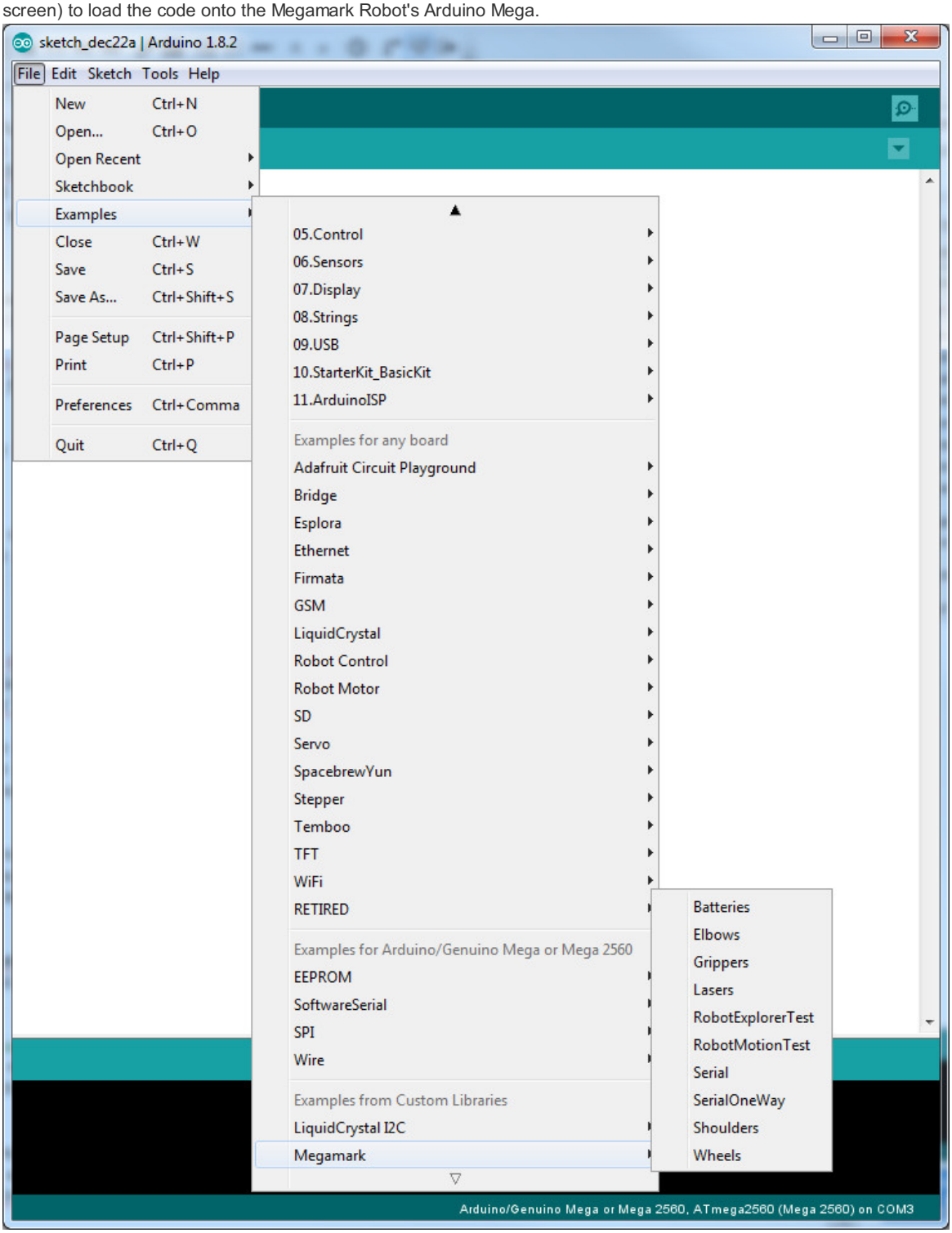


Step 2: Fire up the newly installed Arduino IDE. Set your board type by going into `Tools->Board->Arduino/Genuino Mega or Mega 2560`. Set your COM port by going into `Tools->Port->COM##`.



Some versions of the Choitek Megamark run on an Arduino Mega 1280 for legacy compatibility reasons. If this applies to your Megamark robot, you will also need to change `Tools->Processor->Board->ATmega1280`.

Step 3: Go over to `File->Examples->Megamark->SerialOneWay`. This allows the Megamark robot to communicate over USB serial to Python scripts running on a laptop. Once the example file has been loaded, press the `Upload` button (shaped liked an arrow in the upper left corner of the screen) to load the code onto the Megamark Robot's Arduino Mega.



Once the `SerialOneWay` example has been loaded, the robot should now be programmable using Unity. Note that the regular `Serial` example does not work because Unity C# .NET's serial implementation is not capable of reading serial input coming from the Arduino Mega 2560.