

ECGR4161/5196, MEGR4127 – Introduction to Robotics

Lab Assignment #2– Version 1.0 – Spring 2021

See Canvas for the due date/time

In this lab assignment has two parts and will be done individually. Note that, even though two students can work together, they must submit their own video and report together. The main objective is to load the Energia Toolchain on your computer and compile/run a simple program. We need to ensure ALL students have loaded and can run the tools.

Submission type: Video and lab report (Must include your name and all video requirements mentioned below)

Part 1: Downloading/Installing/configuring the tools

We are going to be programming an embedded systems board using the tool “Energia” – it is an Arduino-like tool. This board, the TI MSP-EXP432P401R, has the MSP432P401R microcontroller as its main processor.

You should go to <https://energia.nu/download/> to download the Energia tool (Mac, Windows, and Linux!). On the page, below the link for the download are links for installing and setting up the tool.

Hint: When you extract the files – USE THE DEFAULT PATH OFFERED!

The general steps are:

1. Download the Energia software tool
2. Download the MSP432 board drivers
3. Unzip (extract) the MSP432 board drivers
4. Load MSP432 drivers (see Energia instructions)
5. Unzip (extract) Energia
6. I suggest you create a shortcut to the Energia tool on your desktop
7. Attach board
8. Open Energia application (IDE)
9. Download board package (MSP432P401R) (pull down from “Tools-> Board -> Boards manager”)
10. Set board to MSP432 (pull down from “Tools -> Board -> Red Launchpad w/msp432p401r EMT (48 MHz)”)
11. Set port (pull down from “Tools -> Port -> COMxx”)

Setup is complete and you are ready to program

Part 2: Programming the MSP432 board

In this part you will run the Energia tool and program it to light the RGB LED with the following pattern:

Off -> red -> blue -> green -> red&blue -> red&green -> blue&green -> red&blue&green -> Off (repeat)

Each of these light patterns (or off) should take 0.5 seconds. See the file on Canvas “blink.txt” for an example of turning on/off one of the colors of the RGB LED.

The video you record should be no more than 30 seconds, and should capture from the moment you start the compile operation and end after showing two cycles of the changing LED colors.

Lab Report - Submission Instructions:

1. Upload a Video to your YouTube account (or other location with a URL).
2. Prepare a file, output to PDF that includes:
 - a. Your name
 - b. Your “partner’s” name (if applicable)
 - c. What the general objective the robot / apparatus is expected to perform, and
 - d. URL of the video
 - e. (in report or video) Commentary on the lab (lessons learned, problems encountered).
3. Upload the PDF to Canvas, Lab 2 submission