

# Introduction to Git and Github – A Hands-on Course

## Class 4: GitHub Hands-On, Part 2

November 17, 2016

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# This Week's Agenda

11/14 Intro to Version Control and Code Collaboration

11/15 Basic Git Concepts

11/16 GitHub Hands-On, Part 1

11/17 GitHub Hands-On, Part 2

11/18 Local Clients and Other Hosts

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# GitHub the Sequel

- Yesterday, we looked at the basic functionality of GitHub for branching, merging, commits, and push / pull.
- Let's look at a couple of other functions

# Gist

- Note the choice in the “new” dropdown for a new Gist
- Gist is a repository for code snippets
- Great place for building libraries and “Gadgets”
- Searchable – helpful for finding code that does [ ... ]

# Wikis

- A wiki is a user-writeable web page
- Allows collaboration of documents
- Commonly used for defining projects across a project team and also for working on feature design and bug resolution
- Also commonly used for project documentation

# Websites

- Github.io is a webserver that provides web page service for all github users
- Makes for nice landing and info pages for projects on github
- Can also be general purpose web pages within the charter of the github site
- One-page generation built-in, but you can load your own pages

# Create a repository <name>.github.io

File Edit View History Bookmarks Tools Help

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GitHub, Inc. (US) | https://github.com/new

Search GitHub

Pull requests Issues Gist

## Create a new repository

A repository contains all the files for your project, including the revision history.

Owner Repository name

cjlford / cjlford.github.io ✓

Great repository names are short and memorable. Need inspiration? How about **upgraded-broccoli**.

Description (optional)

☒ **Public**  
Anyone can see this repository. You choose who can commit.

☐ **Private**  
You choose who can see and commit to this repository.

☒ **Initialize this repository with a README**  
This will let you immediately clone the repository to your computer. Skip this step if you're importing an existing repository.

Add .gitignore: **None** Add a license: **None** ⓘ

**Create repository**

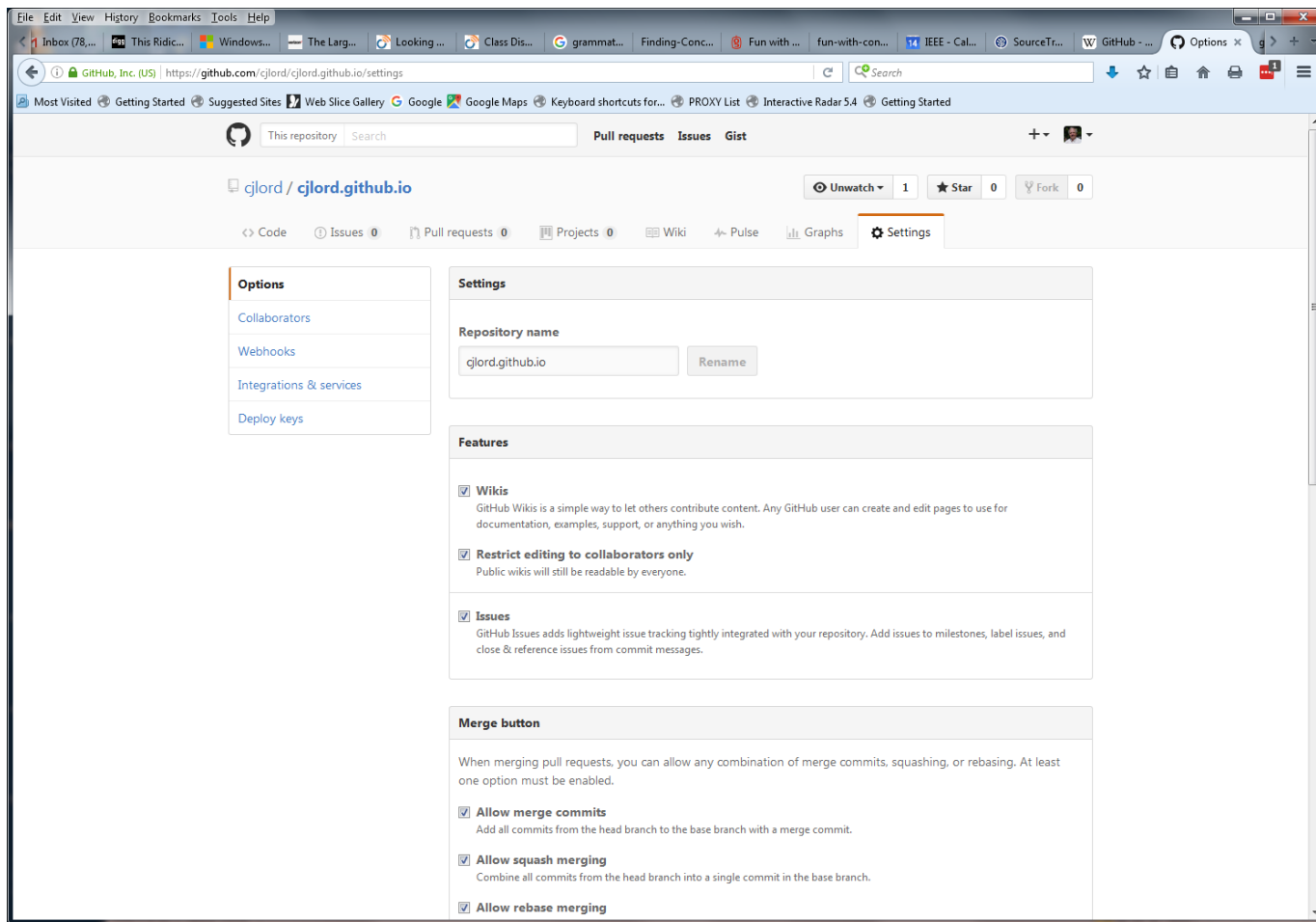
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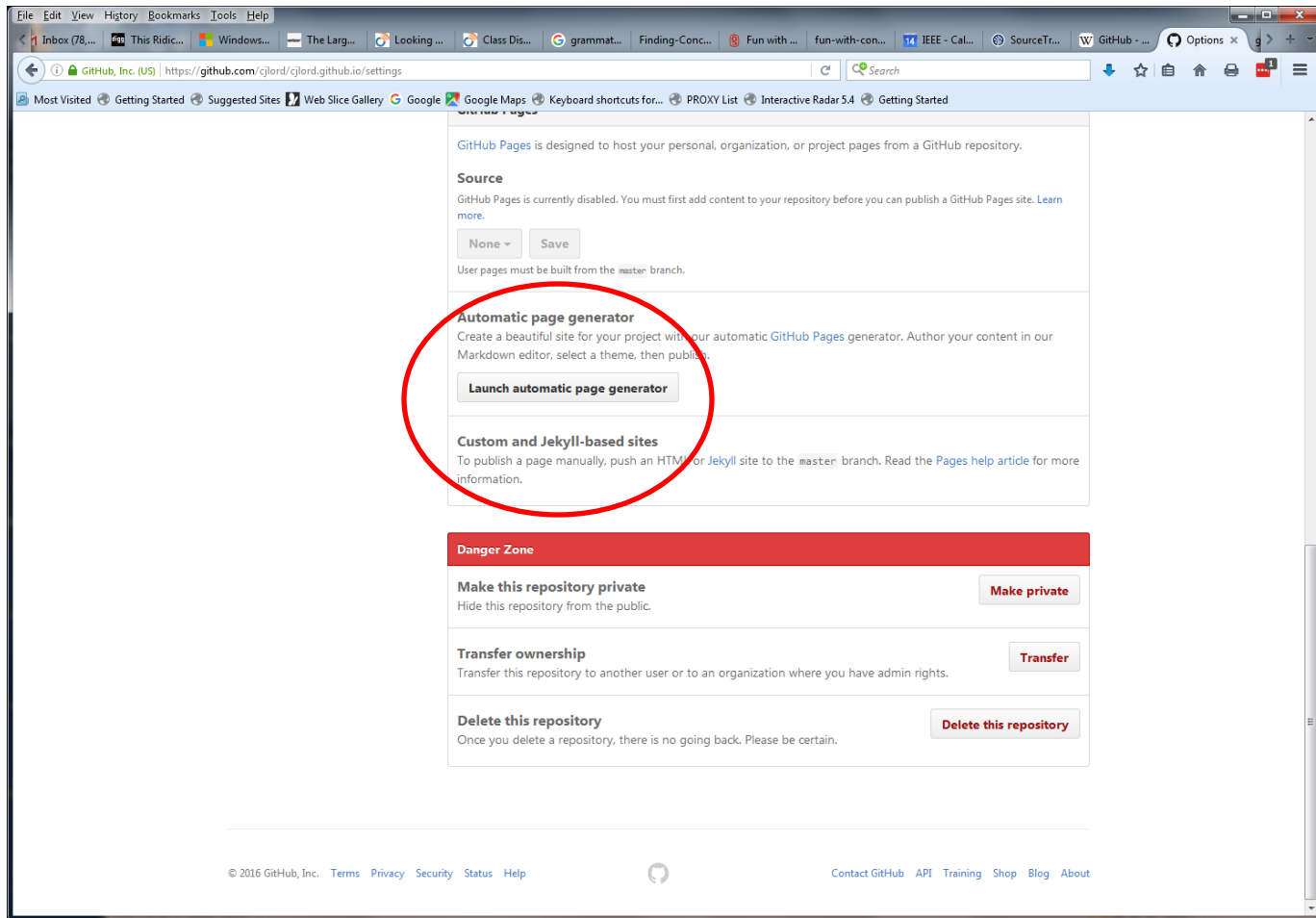


# Click on Settings, scroll down



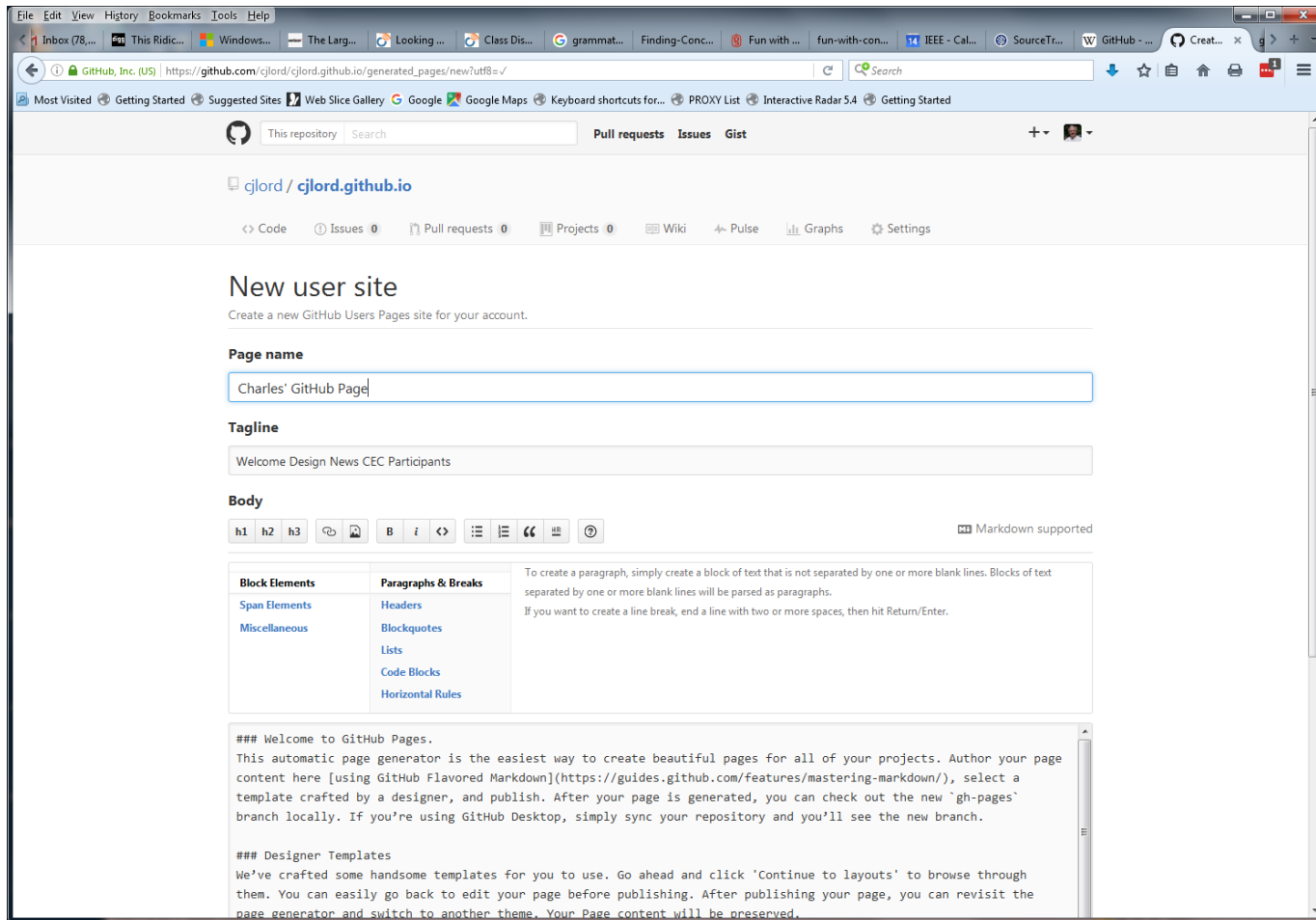
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# Under Pages, Launch Automatic Page Generator\*



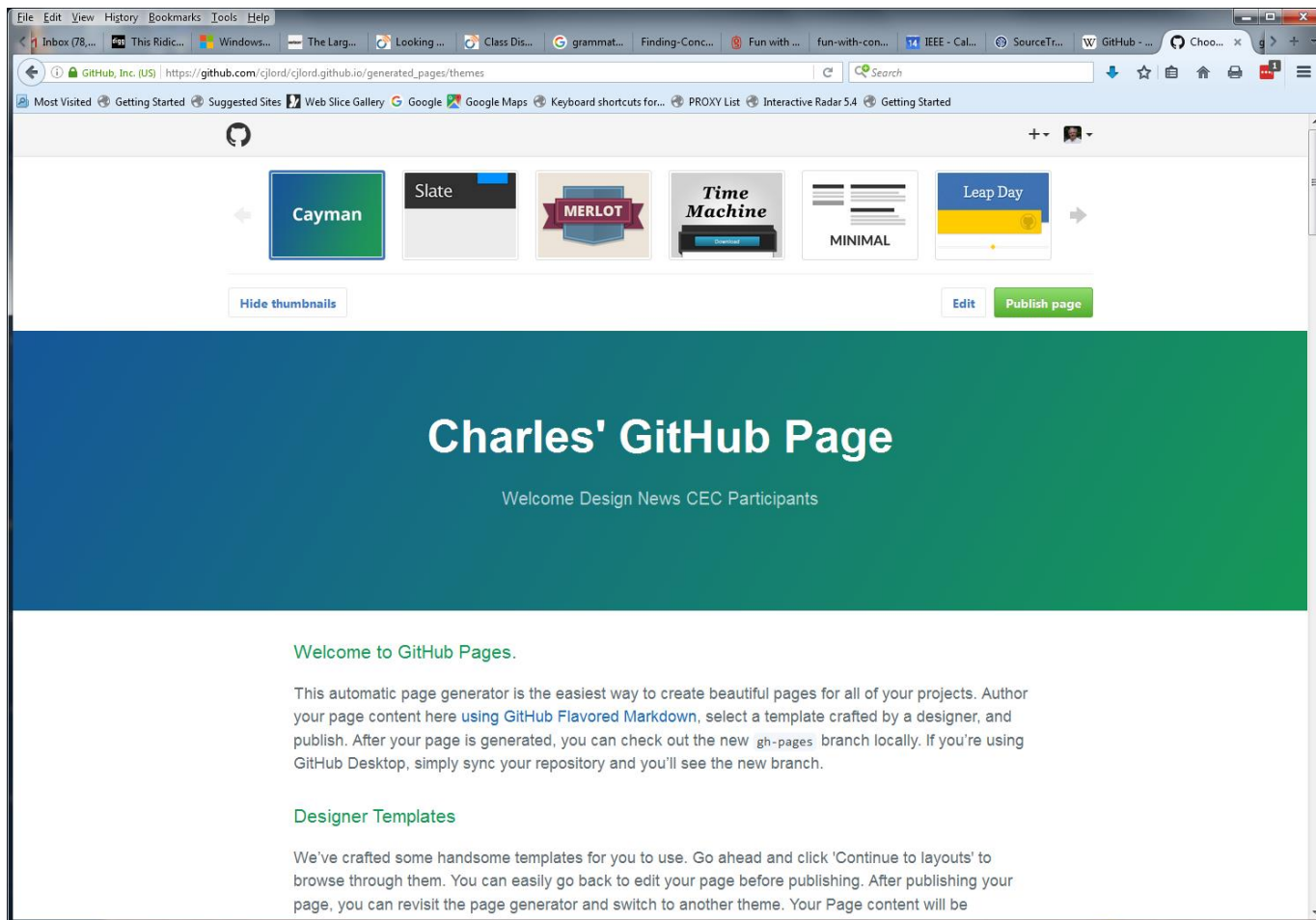
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Change / Add text to suit



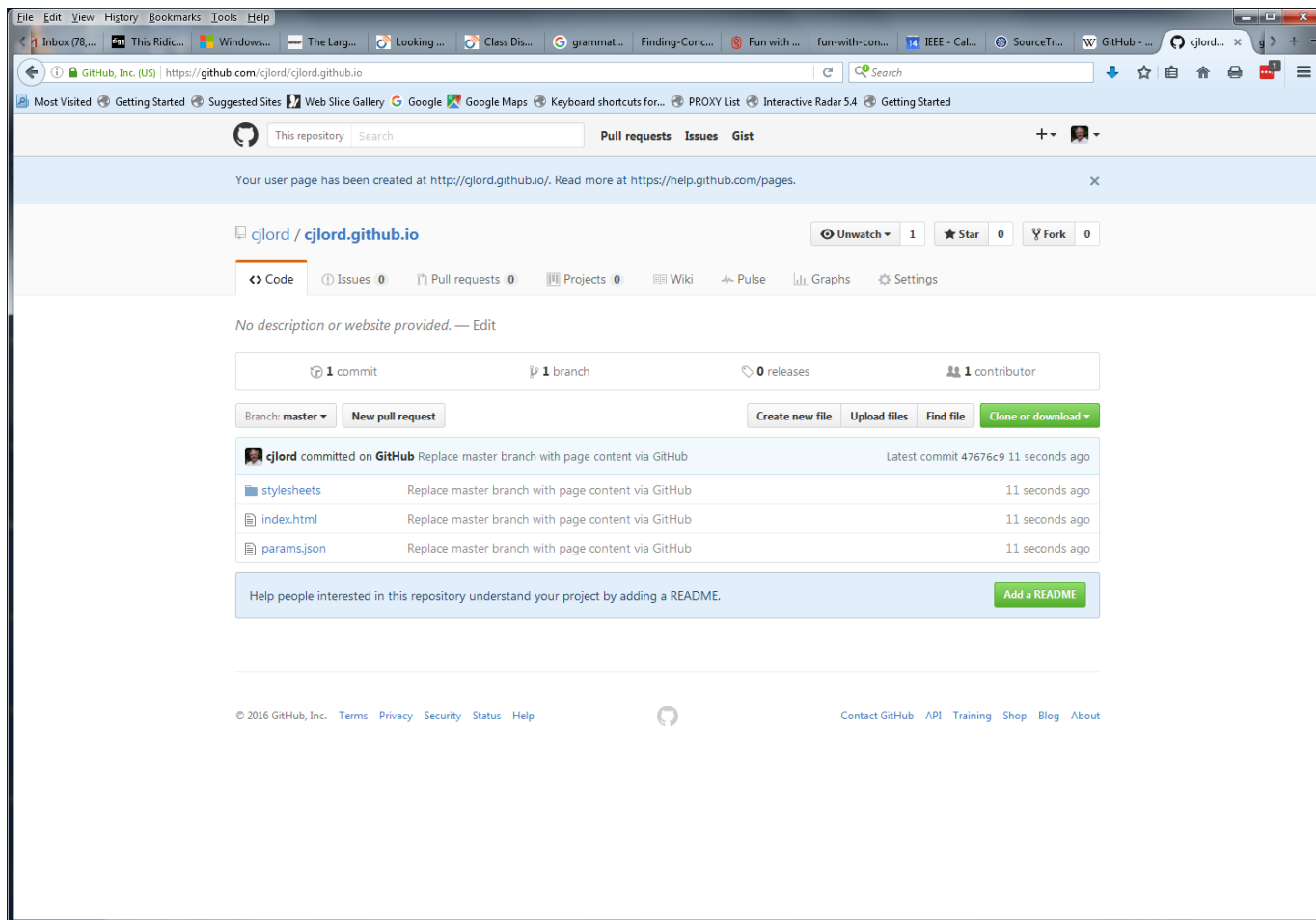
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# You can change themes



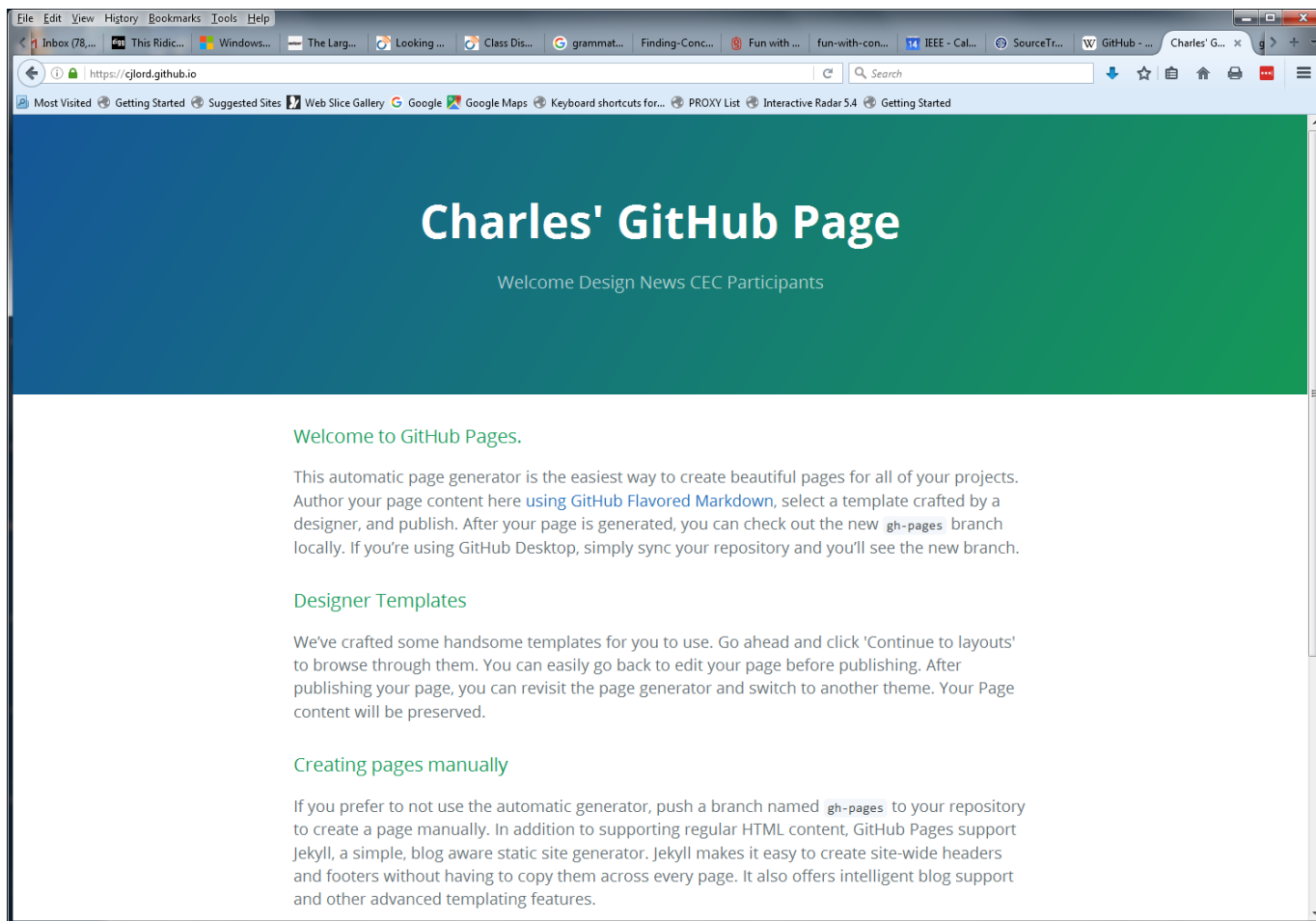
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# Note that the master branch is a website



Presented by:

# And there is my web page



Presented by:

# Web Notes

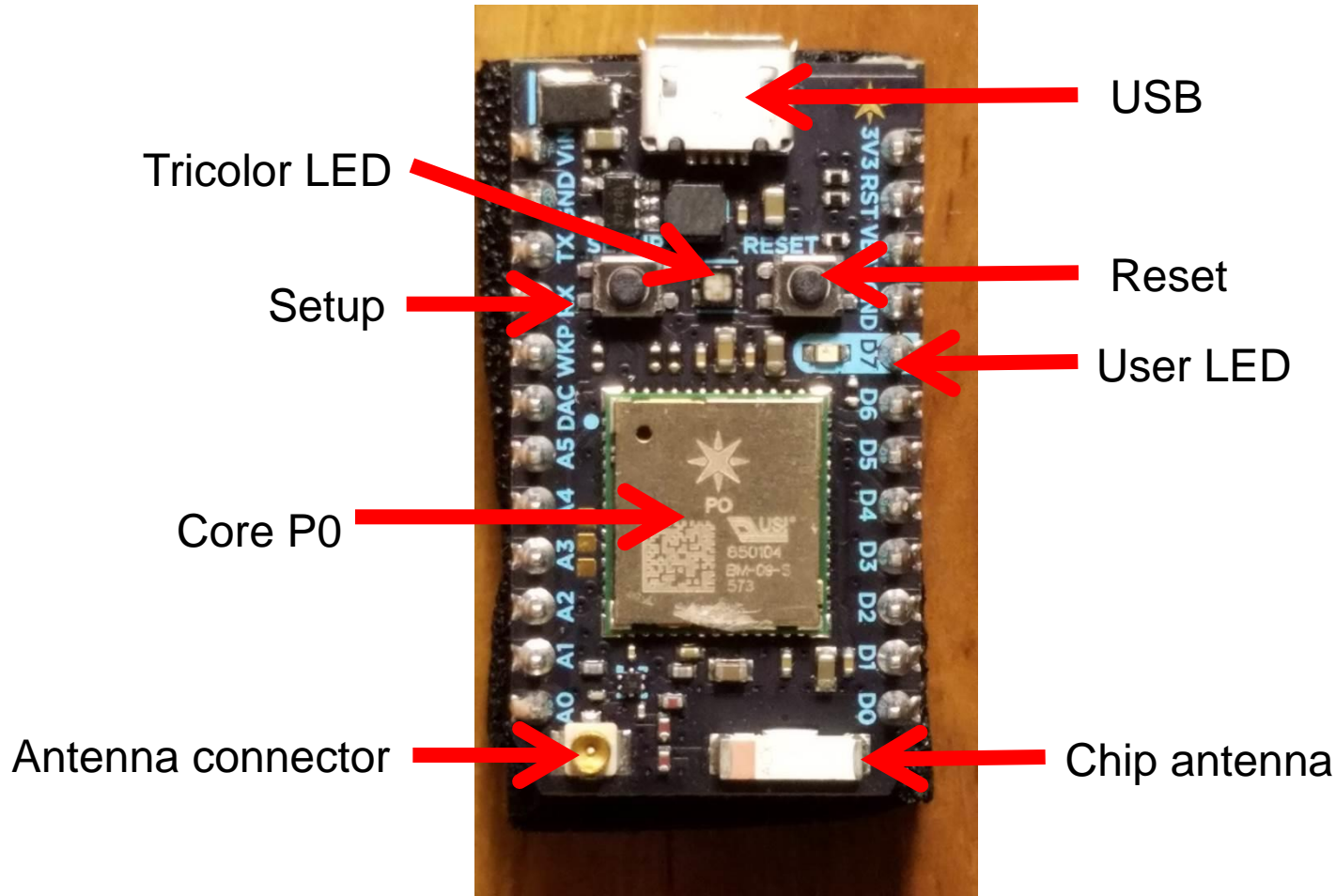
- Note that what we created was a user website, based on our user account and not any of our projects
- We can create a web page within each one of our projects also – and those can be push/pull from a remote location (the user one cannot)

# Makers and GitHub

- We saw yesterday the mind-boggling number of users and repositories on Github
- Most of these are open-source and maker space projects
- Most popular maker platforms have numerous projects on Github
- We want to find a project to clone or fork for our Photon board from an earlier CEC class



# Particle PHOTON



# STM32F205RGY6

- 120Mhz ARM Cortex™ M3
- 1MB flash, 128KB RAM
- 5v Tolerant I/O
- SPI
- PWM
- A/D
- D/A

# Broadcom (Cypress) BCM43362

- Single-band 2.4 GHz IEEE 802.11 b/g/n
- Integrated WLAN CMOS power amplifier with internal power detector and closed-loop power control
- Supports IEEE 802.15.2 external 3-wire coexistence scheme
- SDIO / SPI
- Integrated ARM Cortex™-M3 CPU

# Open Source

- All elements of the board are open source – hardware and firmware
- Full set of tools for commissioning, developing, and testing
- Datasheet at [docs.particle.io/datasheets/photon-datasheet/](https://docs.particle.io/datasheets/photon-datasheet/)
- Repository at [github.org/spark](https://github.org/spark)
- Github class coming Nov 14-18!

# Schematics (and PCB)

[github.com/spark/hardware-libraries#pcb-footprints-land-pattern](https://github.com/spark/hardware-libraries#pcb-footprints-land-pattern)

## PCB Footprints (land pattern)

PCB footprints or land patterns for Eagle are provided as a reference and you may need to adjust them for your application.

Download the Eagle library, unzip it and place it in your Eagle libraries folder.

If you would like to contribute a library with the PCB footprints for another software, like KiCad, please [submit a pull request](#).

See the documentation for more details on the recommended PCB foot prints.

- [Electron](#)
- [Photon with headers](#)
- [Photon surface mount](#)

## How to Use Eagle

If you need more information about how to use Eagle, check out the Sparkfun Eagle Tutorials:

- [Installing an Eagle Library](#)
- [Installing Eagle](#)
- [Creating Schematics](#)
- [Creating Boards](#)
- [Designing Custom Footprints](#)
- [Creating Footprints from Digital Imagery](#)

# Firmware

The Cypress RF chip, with its own M3, allows the off-loading of many complex tasks:

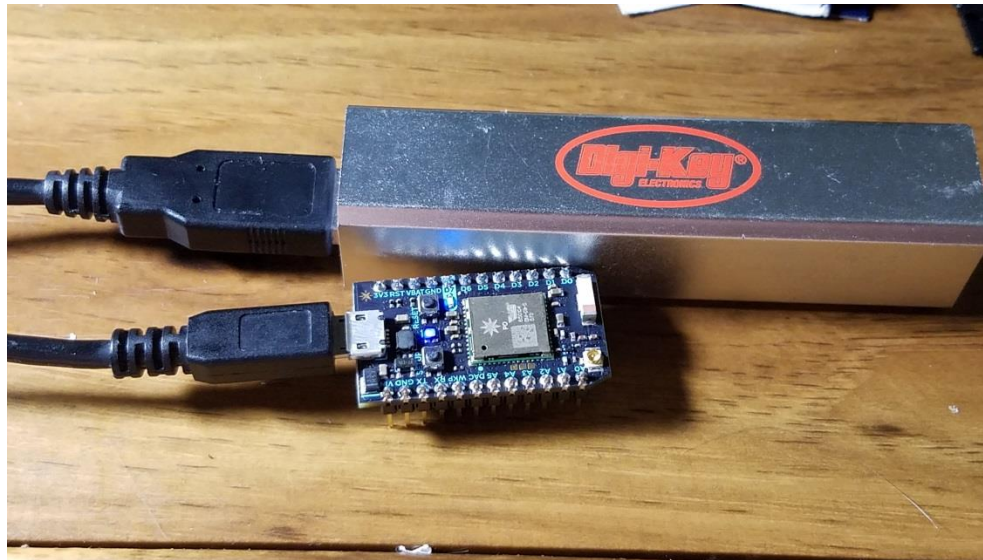
- IP Stack
- WPA and WPA-2 encryption, plus
- Antenna switching
- 802.15.2 support

# STM32F Firmware

- The PHOTON comes with an extensive infrastructure of built-in functions and tools
- Simple programming for fairly complex functionality
- Space for C and other routines
- Can be programmed and re-flashed with your own code in bare metal or RTOS (freeRTOS)

# Quick Test

- Plug a USB A to micro B cable into the PHOTON and either a computer or a USB power supply / battery

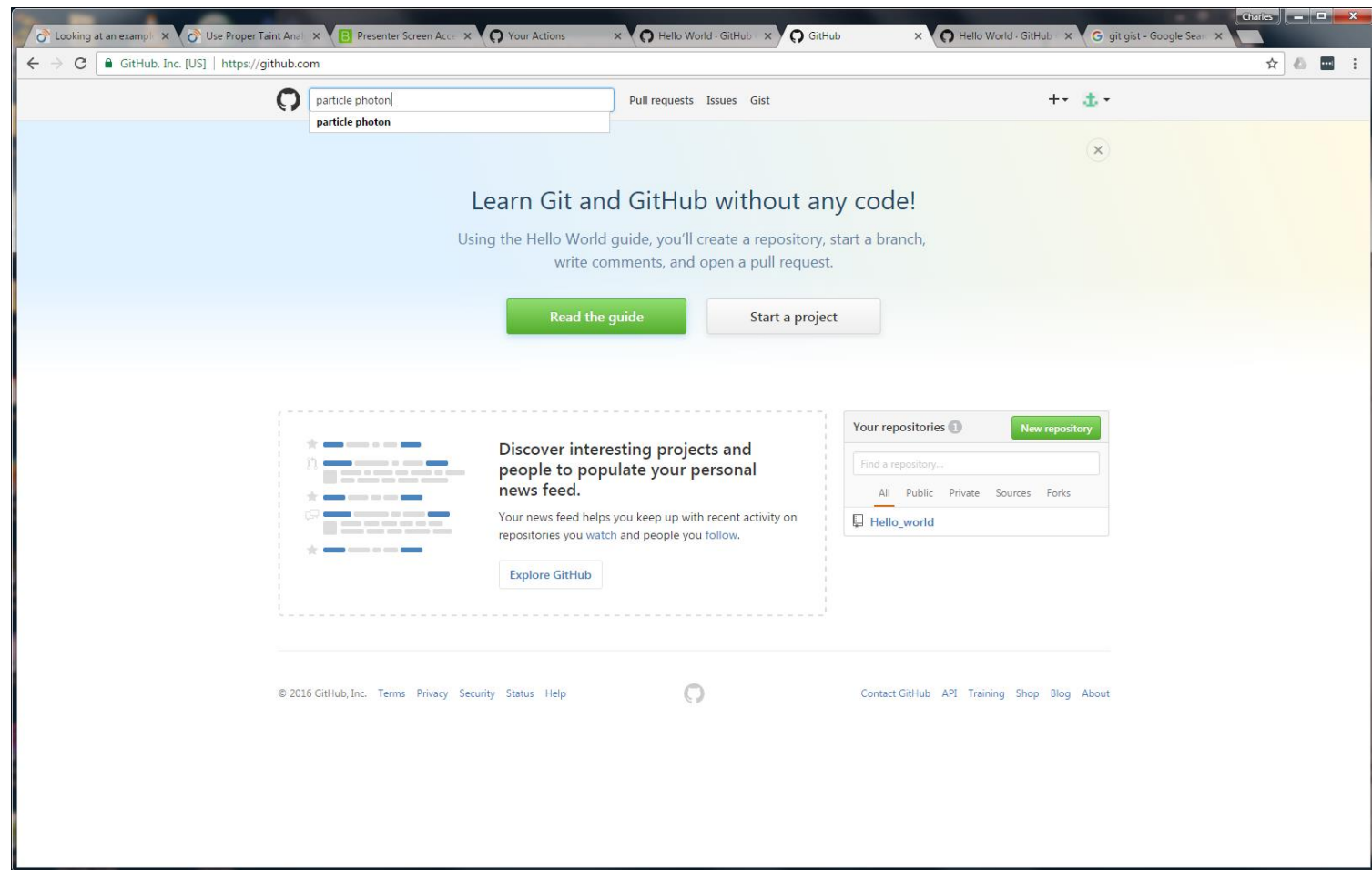




# Where are the PHOTONS?

- We already found one, from the group that designed the board, under the account 'spark'
- We can do some powerful searches to find various types of projects with certain parameters
- Note that this ONLY searches the public repositories; private ones are NOT searchable.

# You can search from any page



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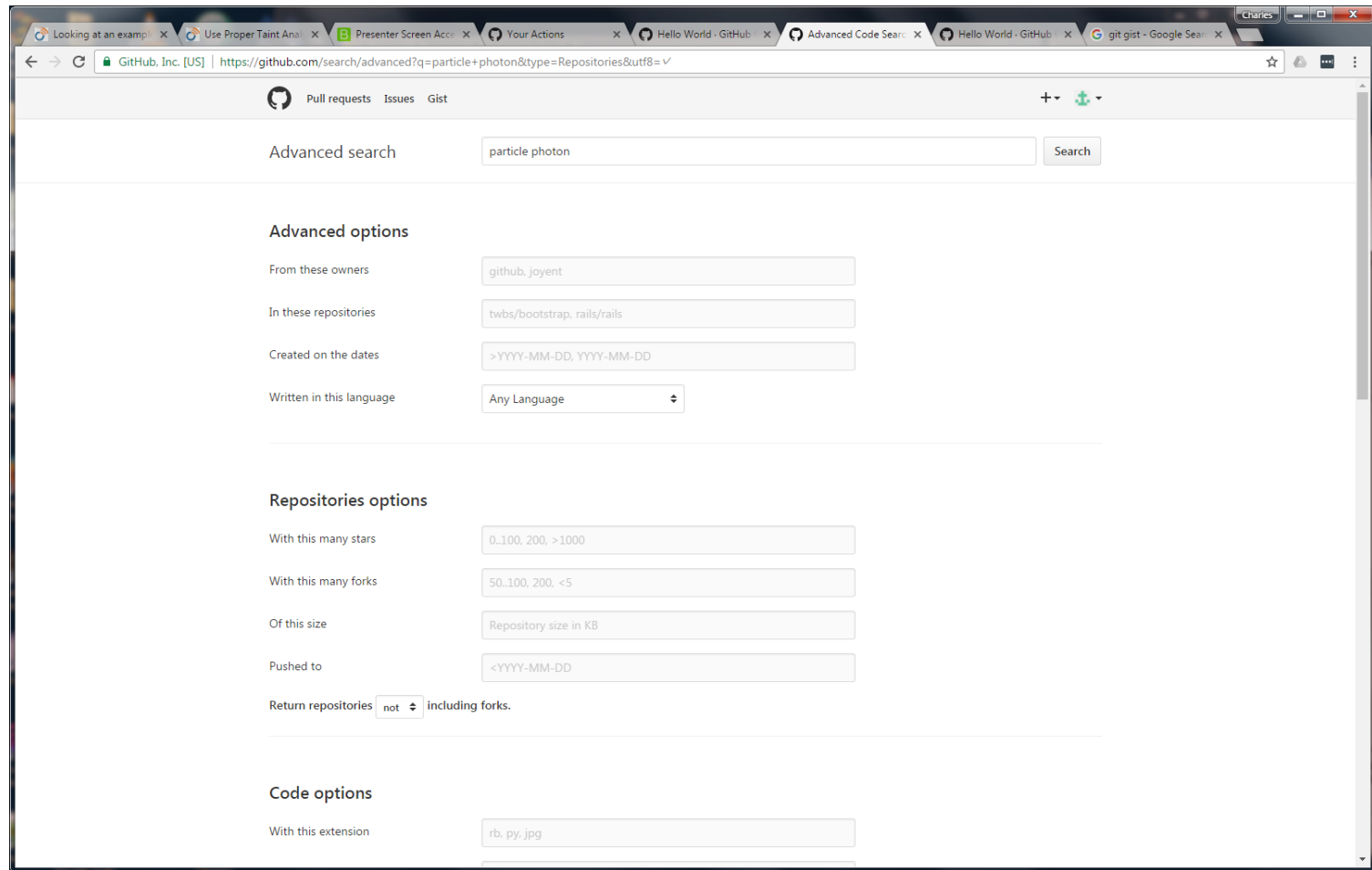
# 585? But we can drill down...

The screenshot shows a web browser window with multiple tabs. The active tab is 'Search - particle photon' on the GitHub website. The search bar contains 'particle photon' and the results show 585 repository matches. On the left sidebar, there are filters for 'Repositories' (585), 'Code' (345,429), 'Issues' (1,027), 'Wikis' (199), and 'Users' (3). Below these are 'Languages' with a bar chart showing counts for C++ (202), Arduino (131), JavaScript (61), Eagle (24), C (14), Java (12), HTML (11), Python (7), C# (6), and CSS (5). The main content area lists repository results:

- spark/photon**: Hardware design files for the Photon, Particle's Broadcom BCM43362 Wi-Fi development kit. 145 stars, 75 forks, updated on Jan 27.
- rwaldron/particle-io**: Particle/Spark Core/Photon IO Plugin for Johnny-Five. 142 stars, 31 forks, updated on Aug 15.
- glowfishAPI/httpsclient-particle**: An httpsclient implementation for particle.io's photon. 42 stars, 16 forks, updated on Feb 18.
- sparkfun/SparkFun\_Photon\_Weather\_Shield\_Particle\_Library**: Use this one library to talk to all the I2C devices on your SparkFun Photon Weather Shield. 14 stars, 25 forks, updated on May 12.
- sparkfun/Photon\_Weather\_Shield**: A wetaher shield for the Particle Photon.

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# Advanced Search Options

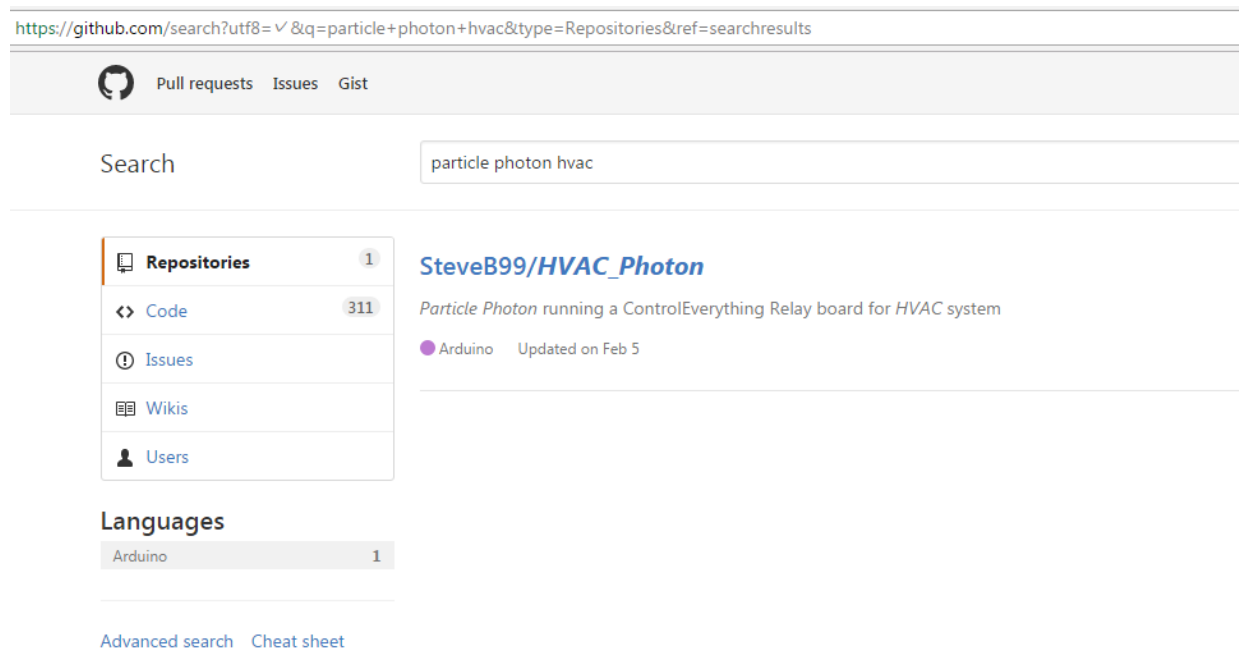


The screenshot displays the GitHub Advanced Search page. At the top, the search bar contains the query "particle photon" and a "Search" button. Below this, the "Advanced options" section includes filters for "From these owners" (github, joyent), "In these repositories" (twbs/bootstrap, rails/rails), "Created on the dates" (>YYYY-MM-DD, YYYY-MM-DD), and "Written in this language" (Any Language). The "Repositories options" section features filters for "With this many stars" (0..100, 200, >1000), "With this many forks" (50..100, 200, <5), "Of this size" (Repository size in KB), "Pushed to" (<YYYY-MM-DD), and a checkbox for "Return repositories not including forks." The "Code options" section has a filter for "With this extension" (rb, py, jpg).

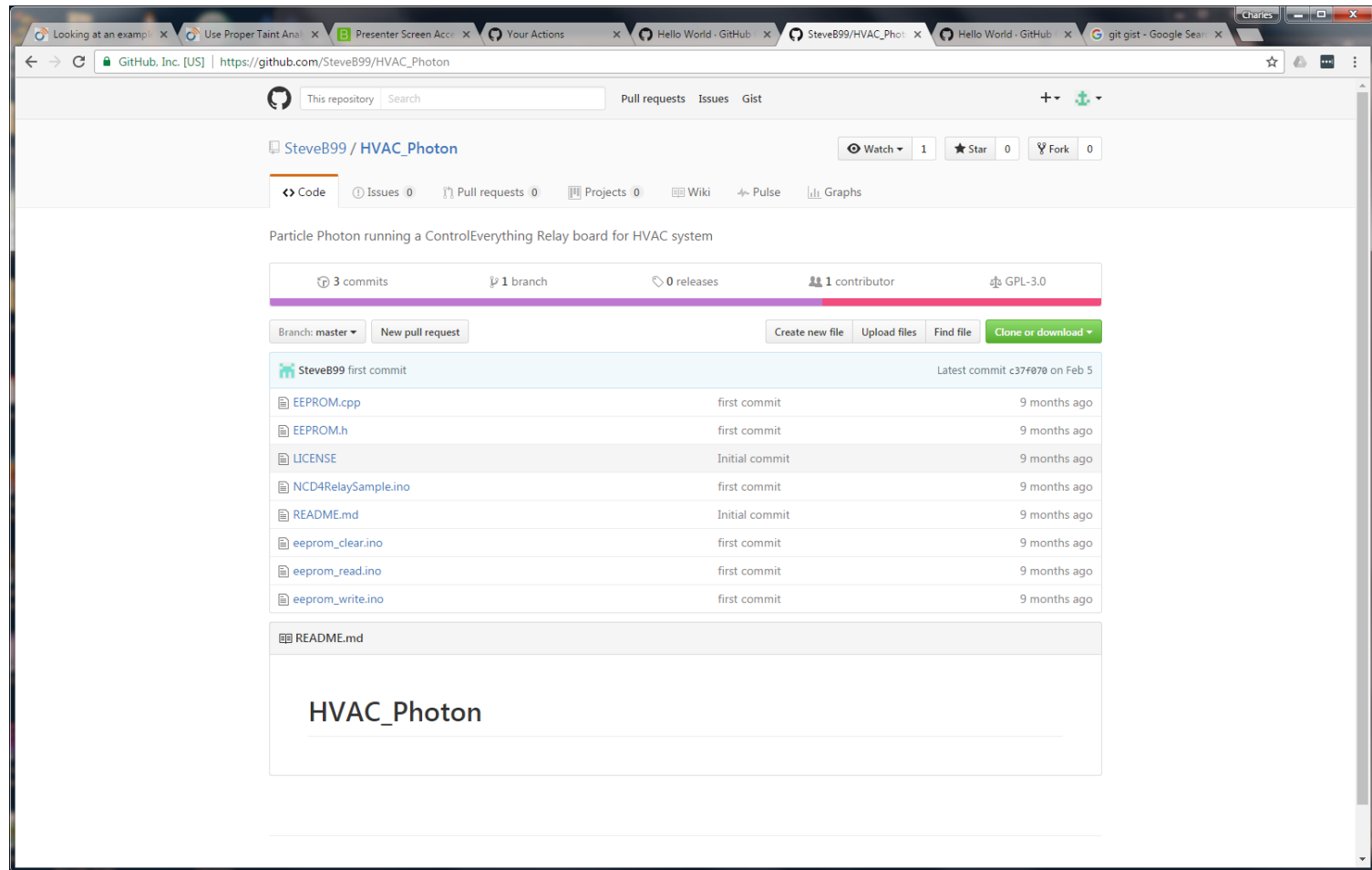
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# Let's say I want a furnace controller

- Searching for “particle photon furnace” gives zero hits, but “particle photon hvac” gives one

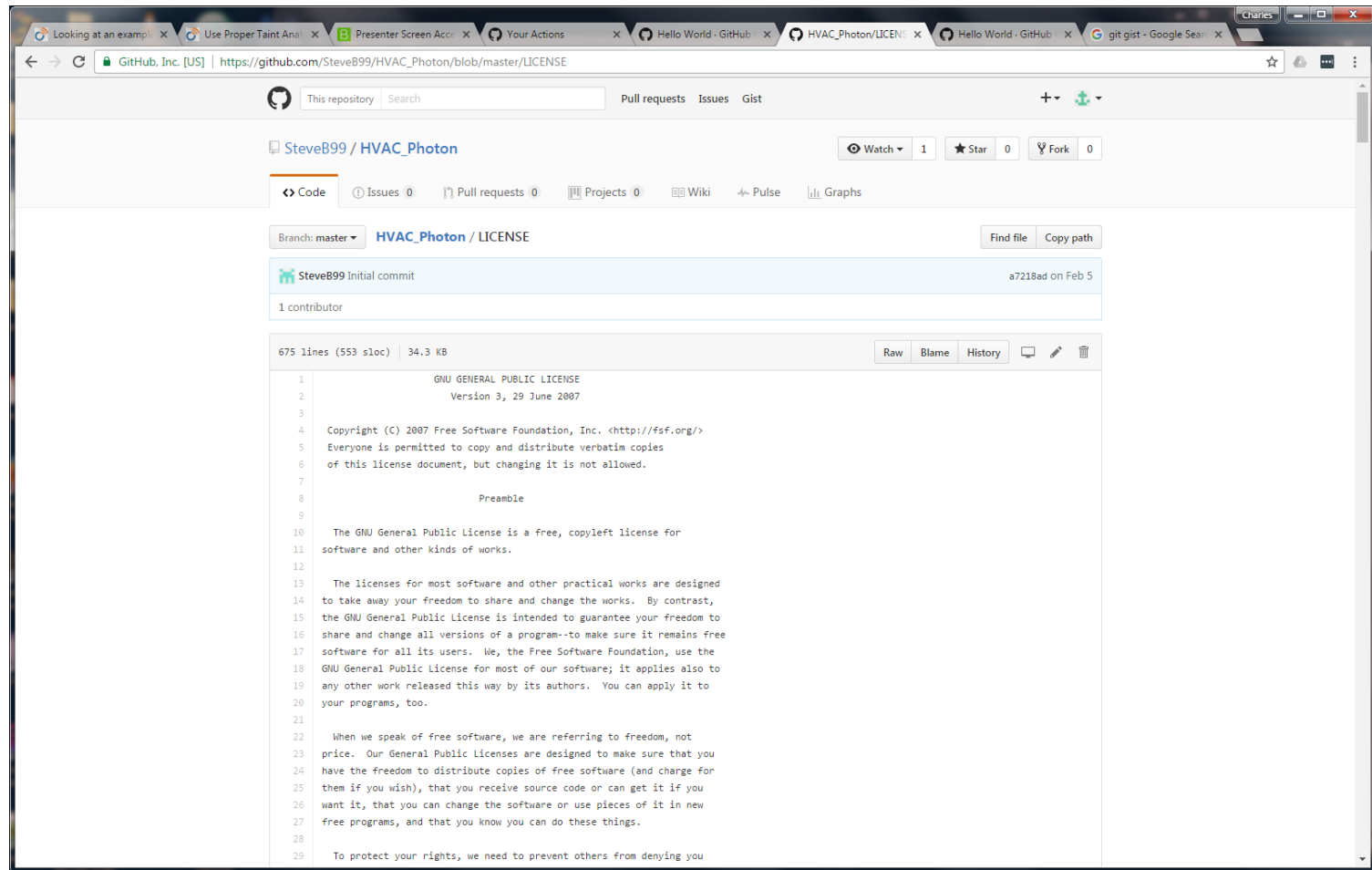


# Interesting...



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# Always check the license



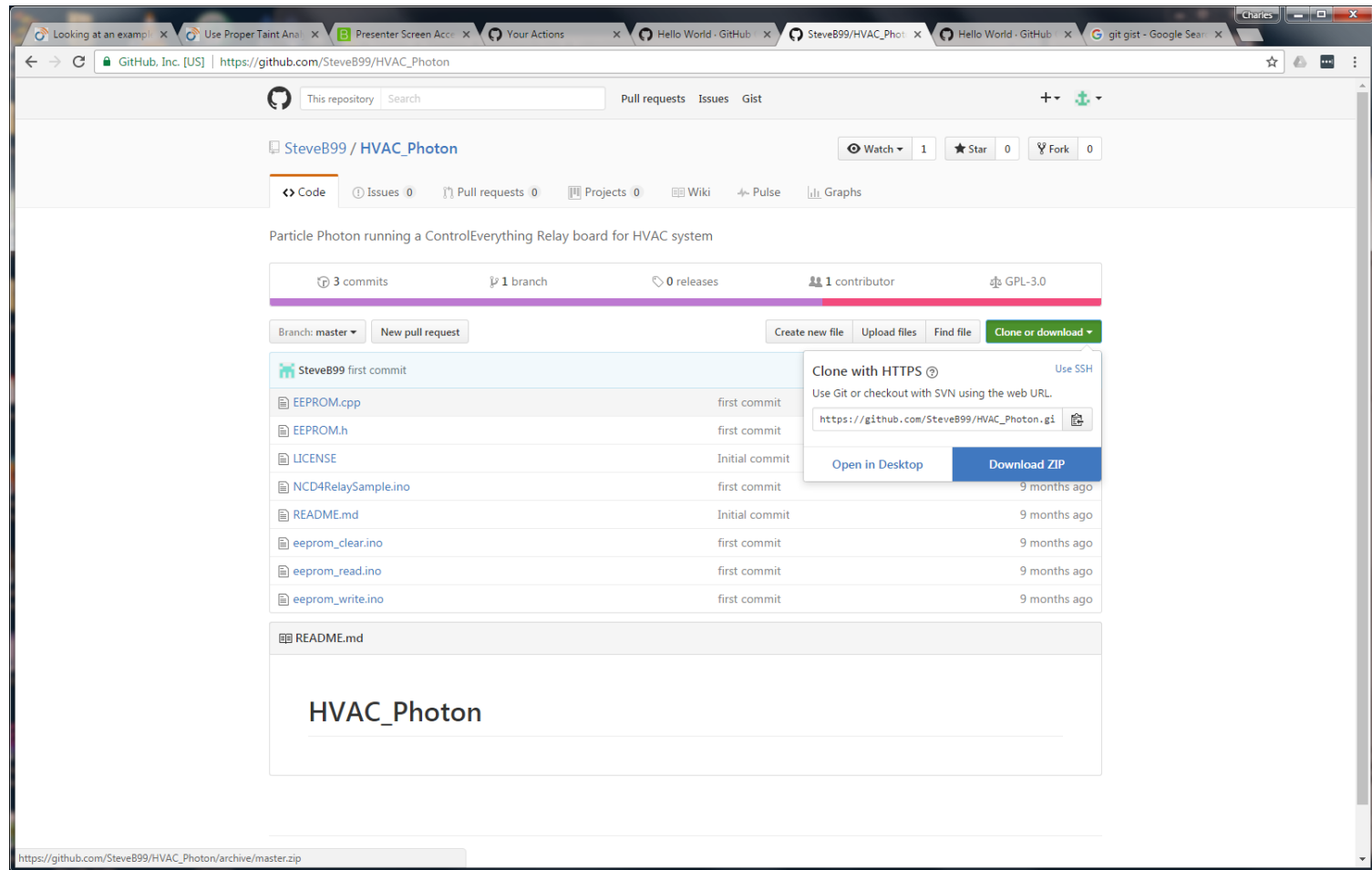
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# Some Observations

- Only one person watching
- Only one commit, no forks, no ratings in 9 mo
- This is definitely SOUP!
- Poking around, we find no real docs and not a lot of comments
- But it is still interesting... I want to clone it and play with it

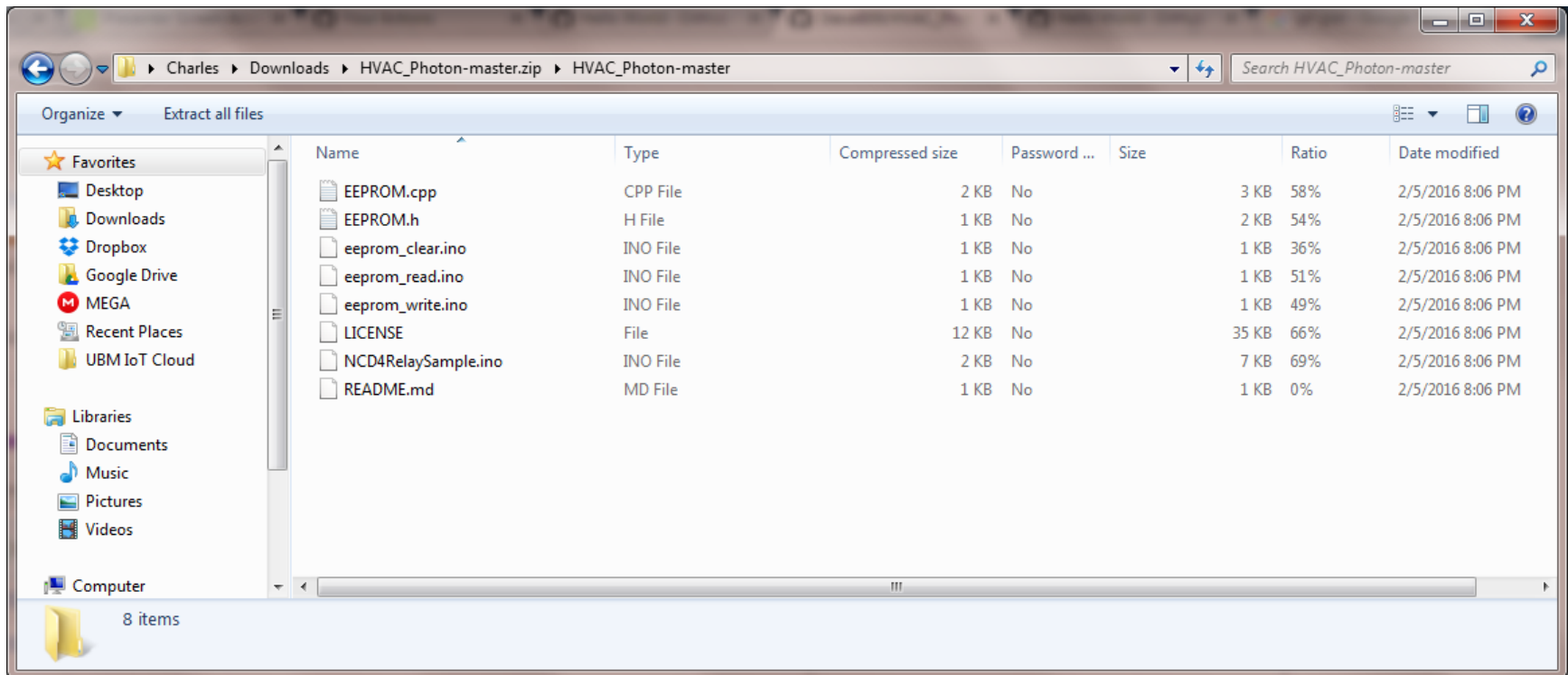


# Choices



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# I chose just the zip file



# A New Project

- Based on the bits of code and my own project objectives, I create a new project directory on my computer
- There will be documentation files to define project
- I will need schematic files (in Eagle)
- Then add git index, and I can clone to my own github account, under a new project name

## Also...

- We can add a wiki for collaboration and discussion, and we should have a nice web page to tie it all together
- TOMORROW – we tie it all together. And talk about Bitbucket!

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# Please stick around as I answer your questions!

- Please give me a moment to scroll back through the chat window to find your questions
- I will stay on chat as long as it takes to answer!
- I am available to answer simple questions or to consult (or offer in-house training for your company)

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