UVicorn in EagleCAD

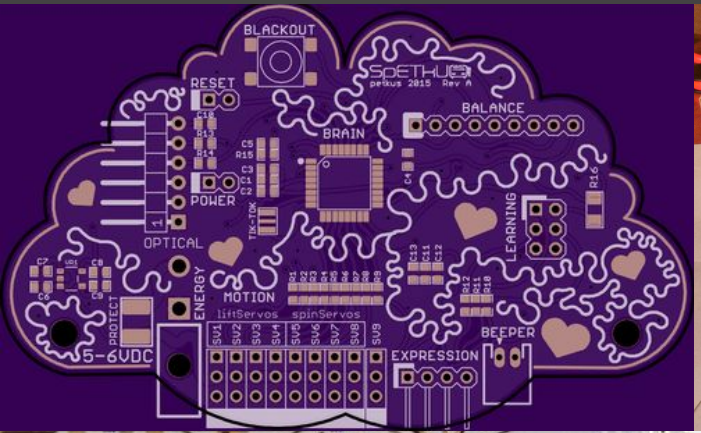
A guide by Matt Pinner & Adelle Lin

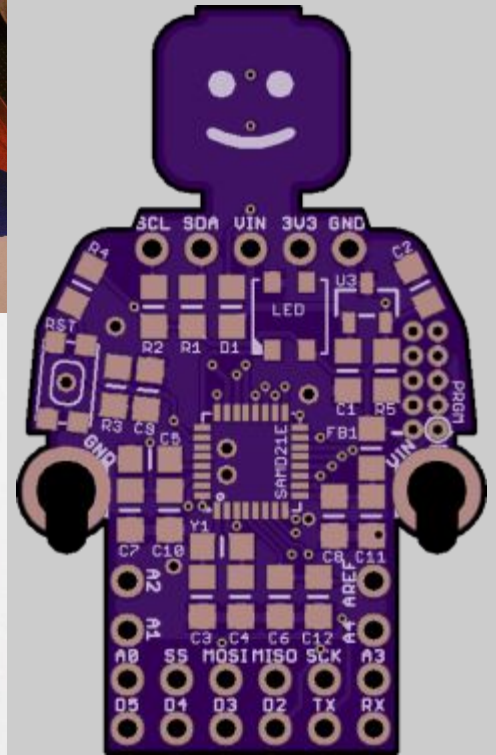
Why Eagle:

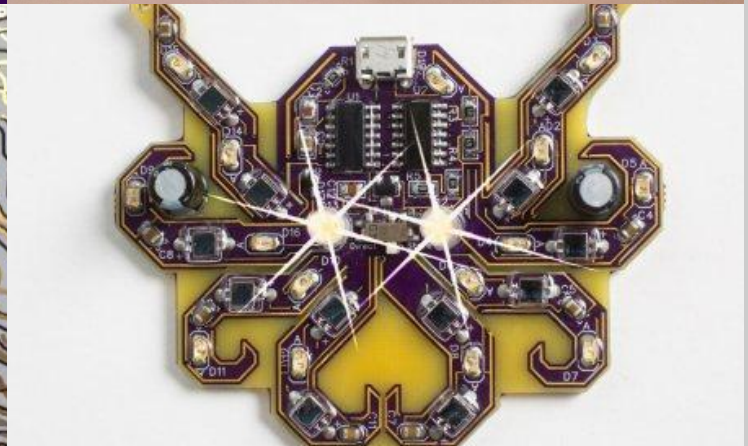
Free to learn
Cross platform
Easy to fab from
Community support
Has Libraries available!!
Scripting / ULP !

Other options:
- Kicad
- Fritzing
- Upverter
- $$$$

Example Projects

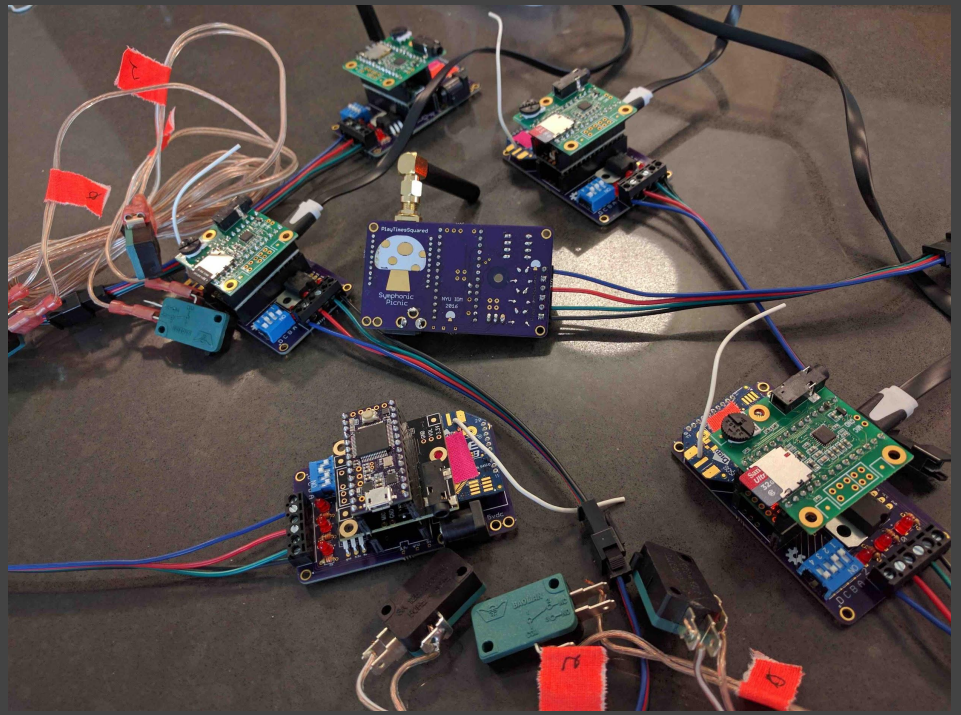






OSHPark


OSH Park
http://oshpark.com/
Kaleidoscope
OSH Park
Perfect Purple
PCBs
VIN
GND
VOUT



Today

- Set up environment in Eagle
- Validate schematic
- Build parts and schematic
- Layout board
- Verify
- Send to OshPark

Terminology

Computer Aided Design (CAD)
Libraries
Parts
Passive Parts
Package
Symbol
Device
Project

Schematic
Circuit
Net
Board
Routing
Layers
Design Rule Check (DRU)
Gerbers
ULP

Setting up your project

Gather Assets

- Art / Logos
- Datasheets / List of Parts (BOM)
- Parts

Add libraries

- copy into /lbr
- use all (Control Panel)

Create needed Parts

Create a New Schematic

Adding Parts

Eagle Interface - *typing* vs. mouse select

Gotchas:

- *ADD* is hard.
- the search is terrible.
- libraries need to be in "Use".
- passive parts are trickie... focus on the package

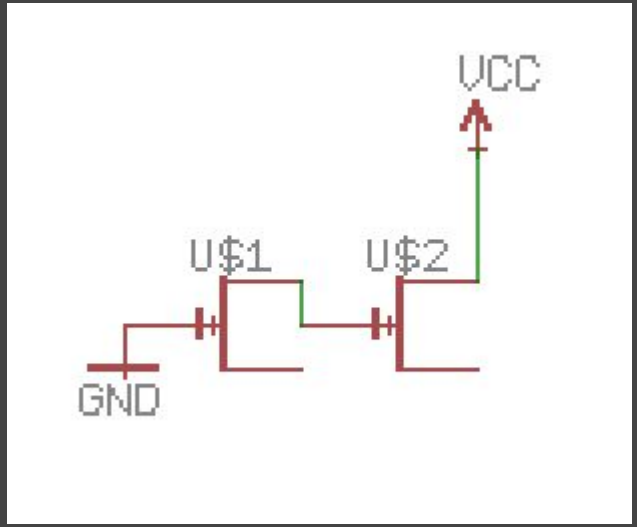
ADD Battery

- Search for CR2032 Battery with term *cr2032*

ADD GND

ADD VCC

Use *NET*, *NAME*, *LABEL*



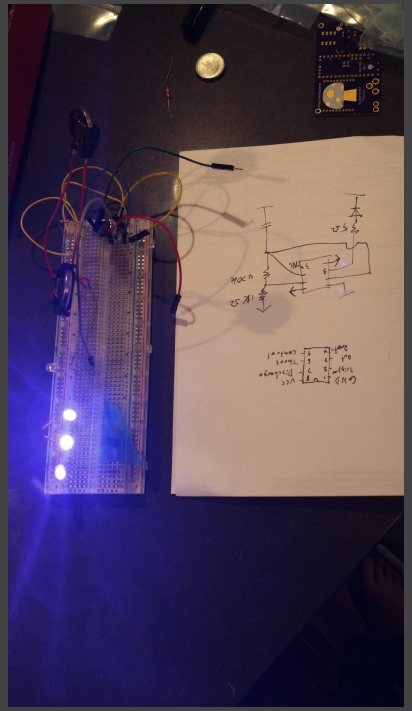
Validate your Schematic

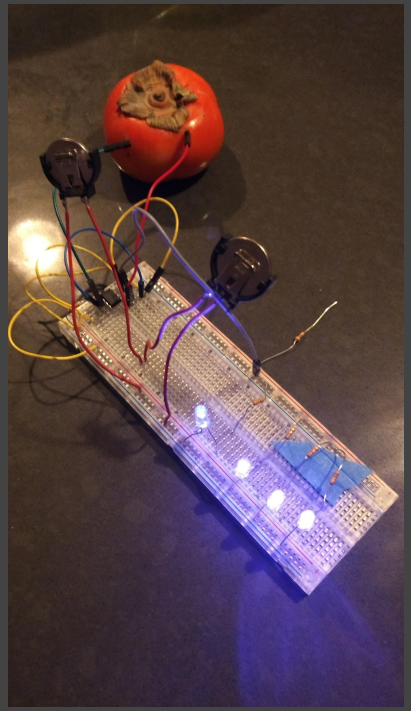
Datasheets

- Max/Min Voltage and Current
- Application Notes
- Part Packages

Search : 555 led flasher

Breadboard where possible : 470k





Board

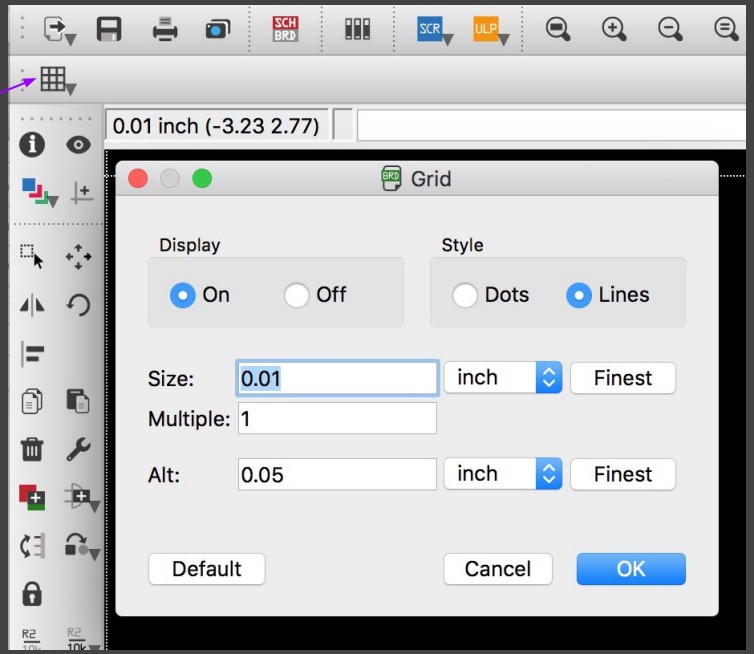
this is generated continually from the SCHEMATIC... keep them together or die

1. placement
2. outline
3. route
4. dru
5. graphics

this is generated continually from the SCHEMATIC... keep them together or die

Placement

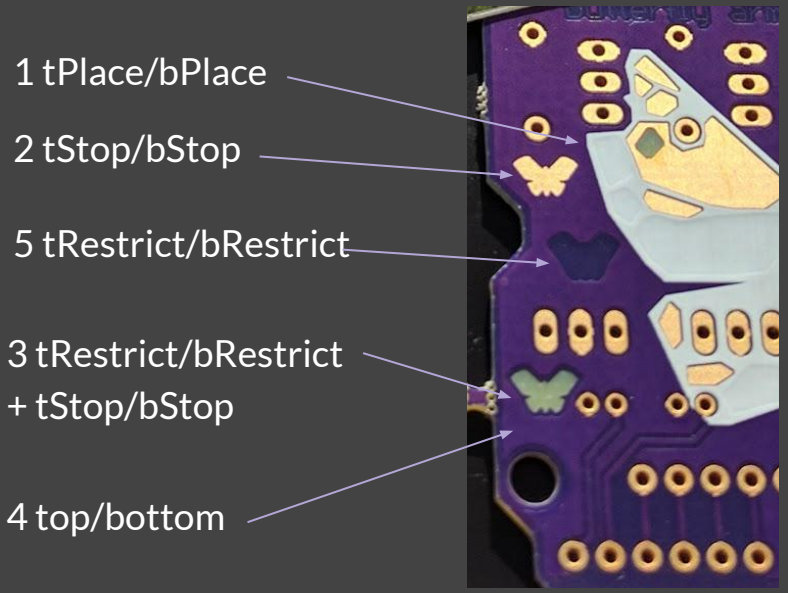
File -> Switch to board
Arrange all the parts
Grids are important
Be logical
Learn about filtering caps,
although not important for this class



Layers

top/bottom
pads/vias
Dimension
tStop/bStop

<u>Silkscreen</u>
tPlace/bPlace
tNames/bNames
tValues/bValues
tRestrict/bRestrict



Outlines

Your board needs a shape

- draw it with the Dimension layer

Start simple at first and refine as you go

Add mounting holes

- *ADD* *hole*

Add terminal blocks near the edge

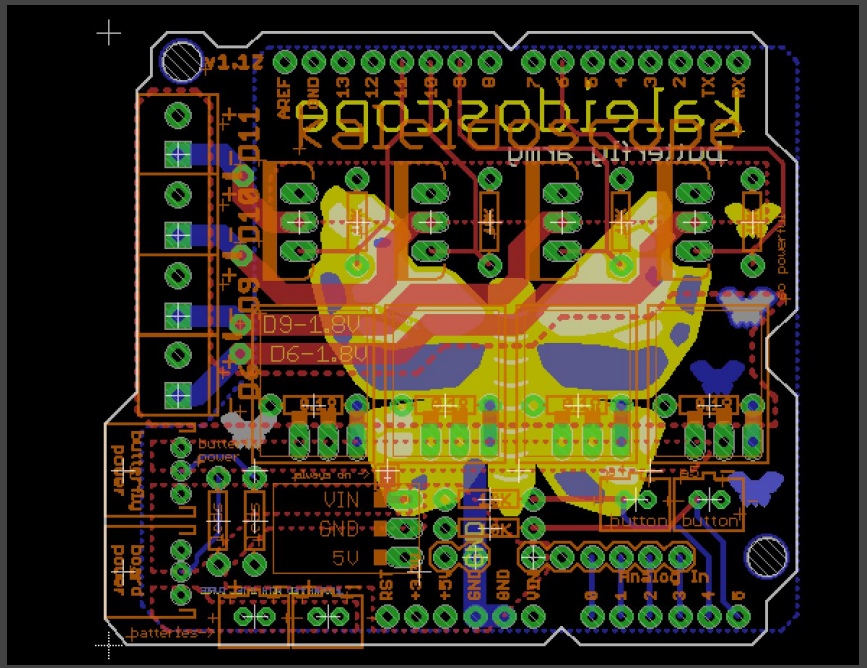
- *ADD* *terminal* under Connectors

Think about other interface elements

Make sweet shapes

Round those corners

- miter tool: type in radius



Routing

SAVE OFTEN

RIP * (undo routes) and *RAT* (recalc airwire path)

Layers are important - vias

Auto-router sucks mostly always, but try it first

Trace widths are important

Ground Pour:

- choose Bottom Layer
- draw Polygon
- Name it
- rat

Design Rules Check

Import from your fab

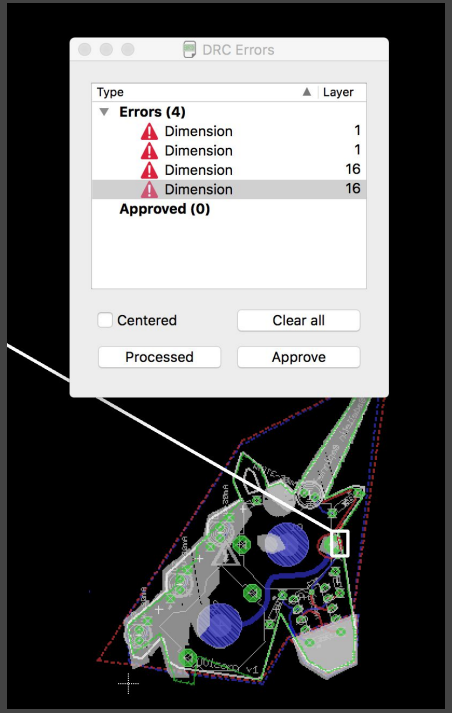
- oshpark 2layer.dru

Try lots of different ones

Run them early and often

Many errors related to silk and clearance

- don’t really matter, but good to know about



Graphics

SAVE OFTEN
Label everything
RUN import-bmp
300 dpi is the max
SAVE OFTEN
hide, group, and change layers