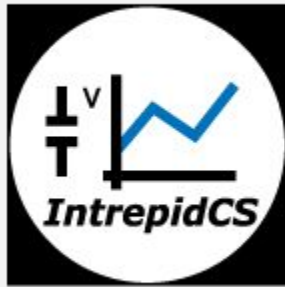


DIY Robocars

Day 1: The Embedded World



INTREPID
CONTROL SYSTEMS



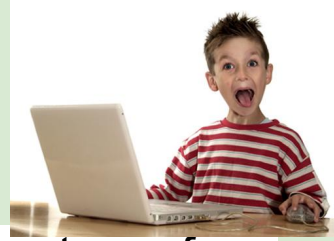
Introducing Yourself

Agenda

- Python Basics
- Interfacing OpenMV Camera
- First Test Drive



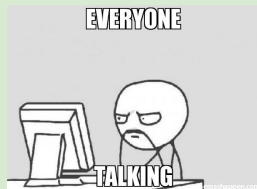
Computer Program



- A computer program is a set of instructions that causes a computer to perform some kind of action.
- It isn't the physical parts of a computer—like the wires, microchips, cards, hard drive, and such—but the hidden stuff running on that hardware.
- usually refer to as just a program

Programming Language

- Particular way to talk to a computer—a way to use instructions that both humans and the computer can understand.



- It isn't the physical parts of a computer—like the wires, microchips, cards, hard drive, and such—but the hidden stuff running on that hardware.
- Python programming language was named after the Monty Python's Flying Circus TV show





Open <https://repl.it/> and
select python

Hello World



Python Operators

- Basic Python Operators

- Multiplication (*)
- Addition (+)
- Subtraction (-)
- Division (/)

- forward slash (/) is used for division

<http://dai.ly/xhp3ac>

Hardware



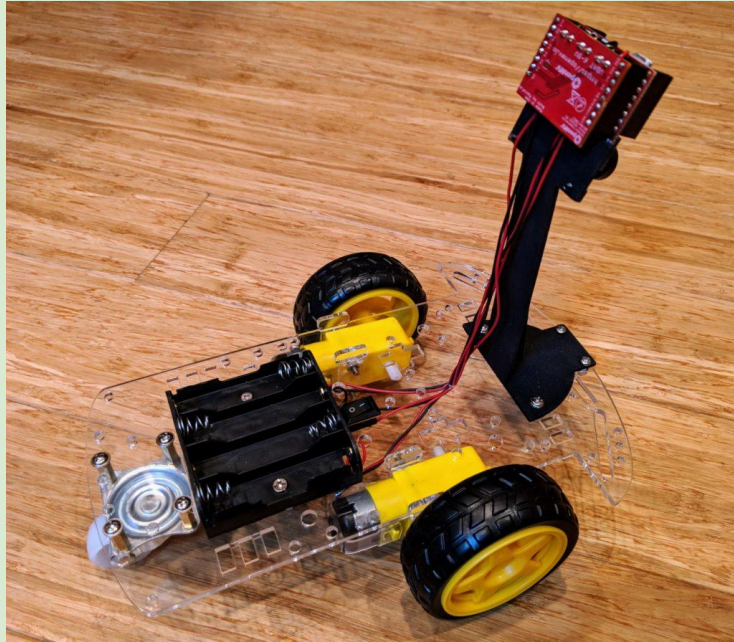
YES!



FINALLY!

memegenerator.net

Hardware



Wait...



HOW UBER'S FIRST SELF-DRIVING CAR WORKS

Top mounted **LiDAR** beams 1.4 million laser points per second to create a 3D map of the car's surroundings.

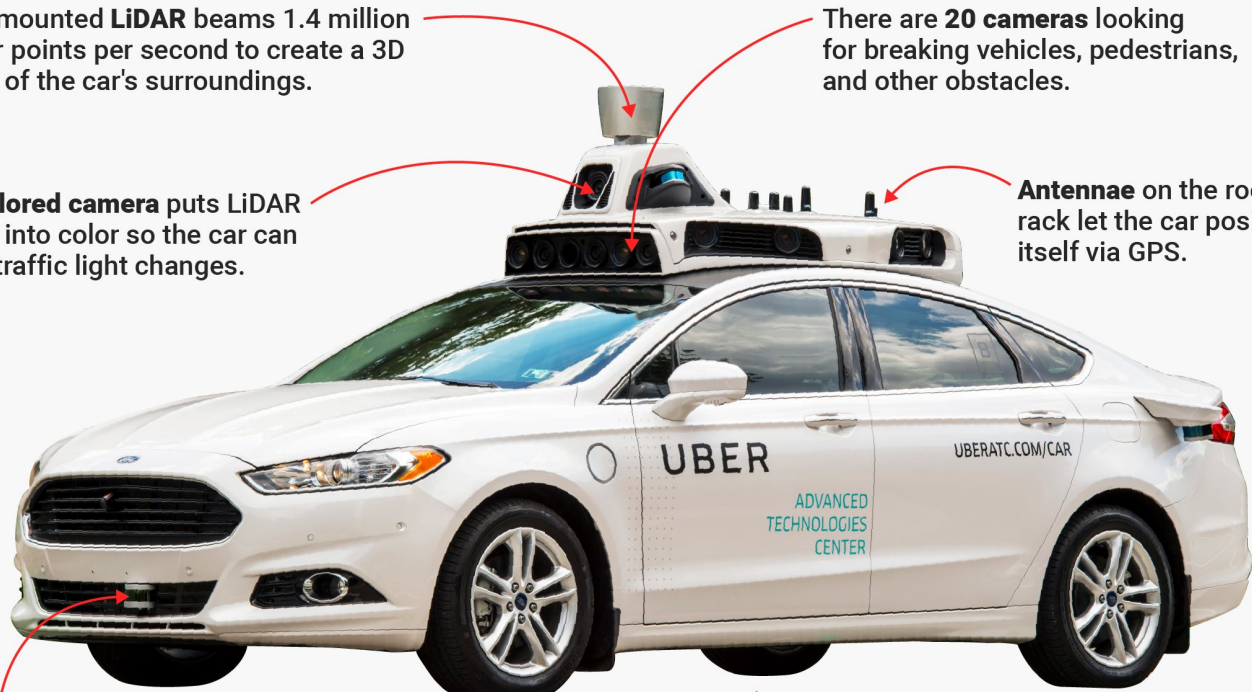
There are **20 cameras** looking for breaking vehicles, pedestrians, and other obstacles.

A **colored camera** puts LiDAR map into color so the car can see traffic light changes.

Antennae on the roof rack let the car position itself via GPS.

LiDAR modules on the front, rear, and sides help detect obstacles in blind spots.

A **cooling system** in the car makes sure everything runs without overheating.





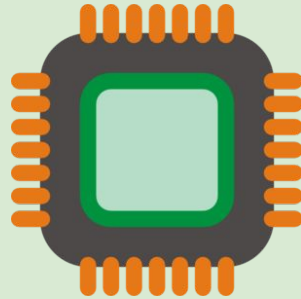
*“Does your car have any idea why
my car pulled it over?”*

What is OpenMV?

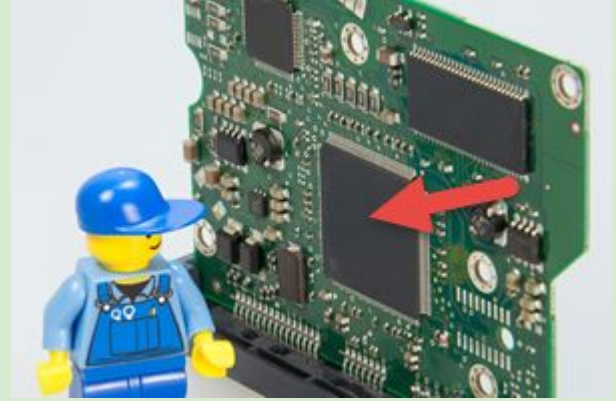
- Making machine vision more accessible to beginners
- User-friendly, open-source, low-cost machine vision platform.



What is a Microprocessor?



Microprocessor



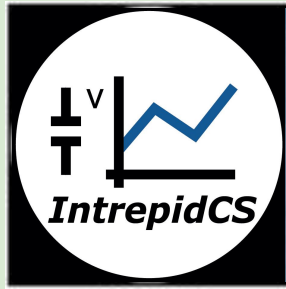
- Aka Central Processing Unit (CPU)
- The “brain” of the computer. Here’s a Lego dude looking at a CPU. It’s the chip the arrow is pointing at
- Your Computer has a CPU, but probably not a Lego guy inside
- The CPU is the thing that runs programs. When you write a program, you’re telling the CPU what to do.

Software?



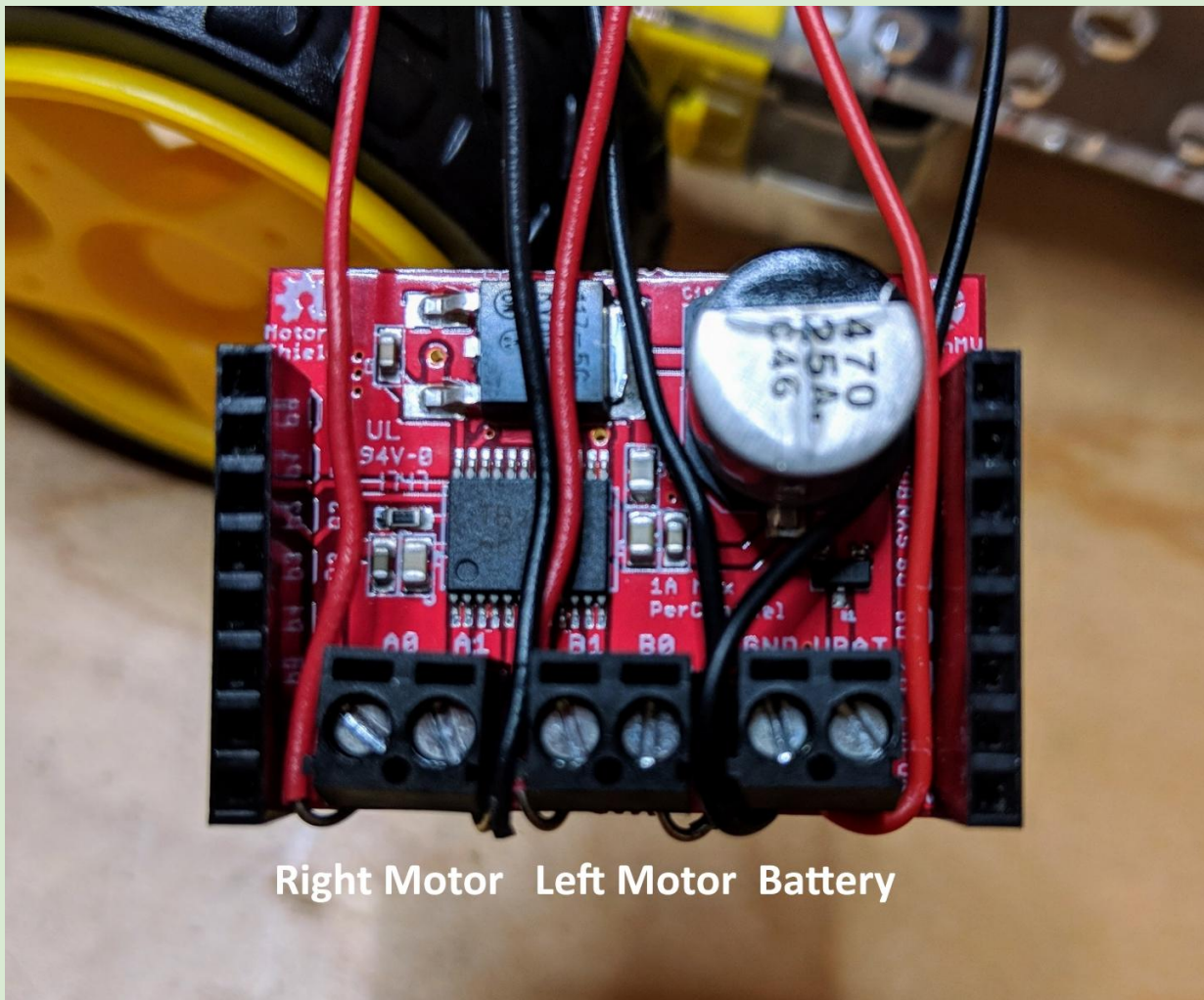
Install OpenMV IDE

Unboxing

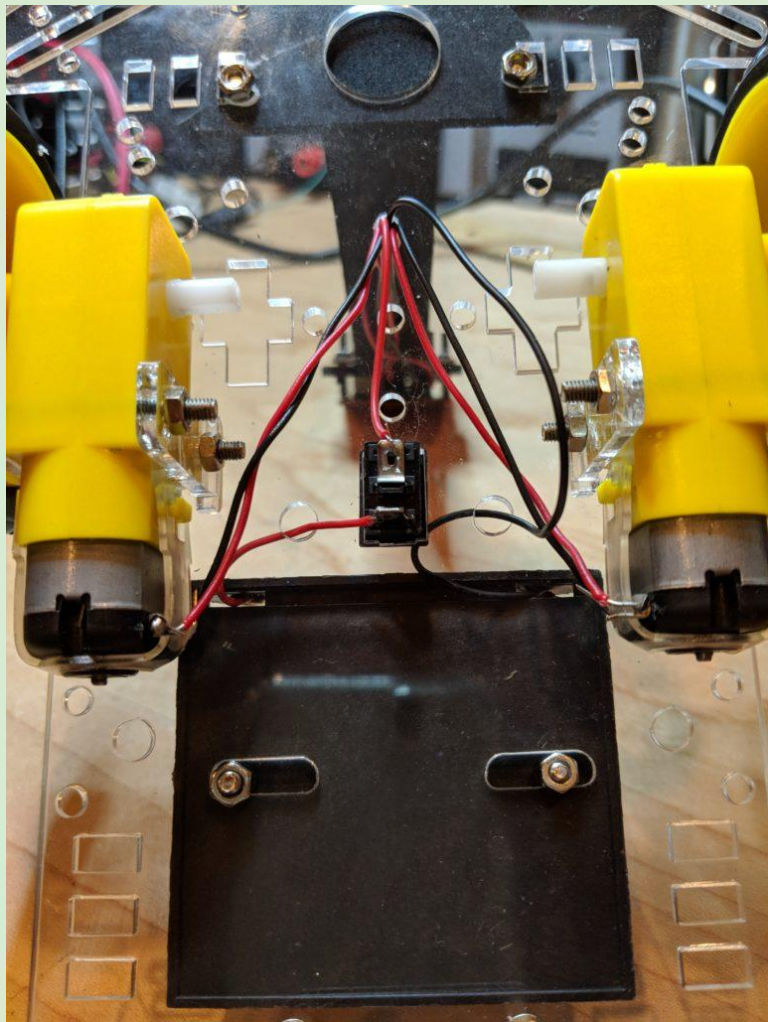
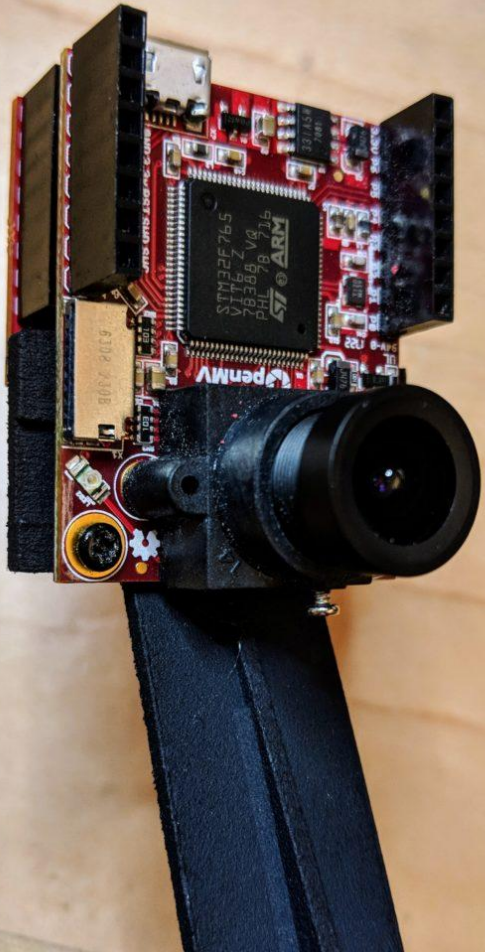


What should be in front of you

1. OpenMV Camera
2. Motor Shield
3. Robot car chassis
4. 3D Printed OpenMV mount
5. Polarizing filter
6. Usb Cable
7. Rechargeable Batteries



Right Motor Left Motor Battery

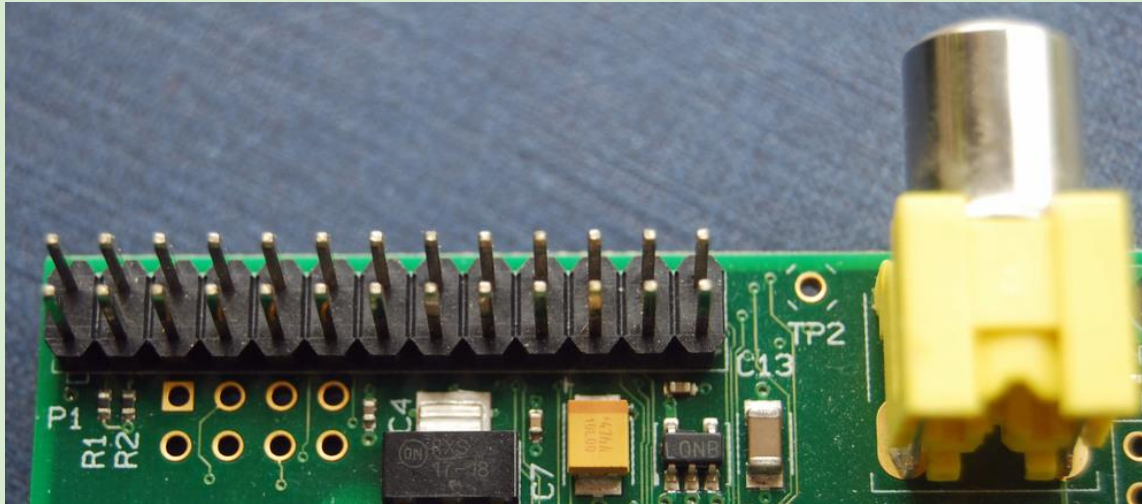


What is GPIO?



GPIO Pins

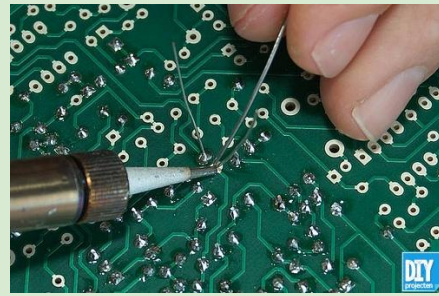
- General Purpose input/output pins
- Pins are a physical interface between the Micro controller and the outside world



WAIT!! what is soldering?



Soldering



- Solder is a metallic “glue” that attaches electrical components.
- Great conductor for electricity.
- Soldering is a process in which two or more metal items are joined together by melting and then flowing a filler metal into the join



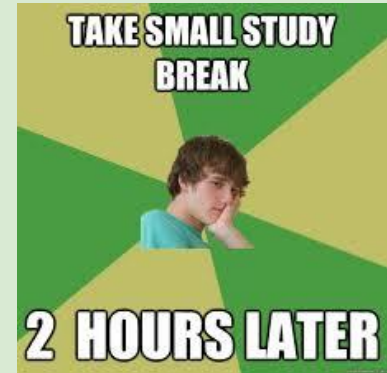


Breadboard





Break





Using Laptop to control OpenMV Camera



Plug in your USB Cable to
OpenMV

Is your OpenMV Camera Running?



