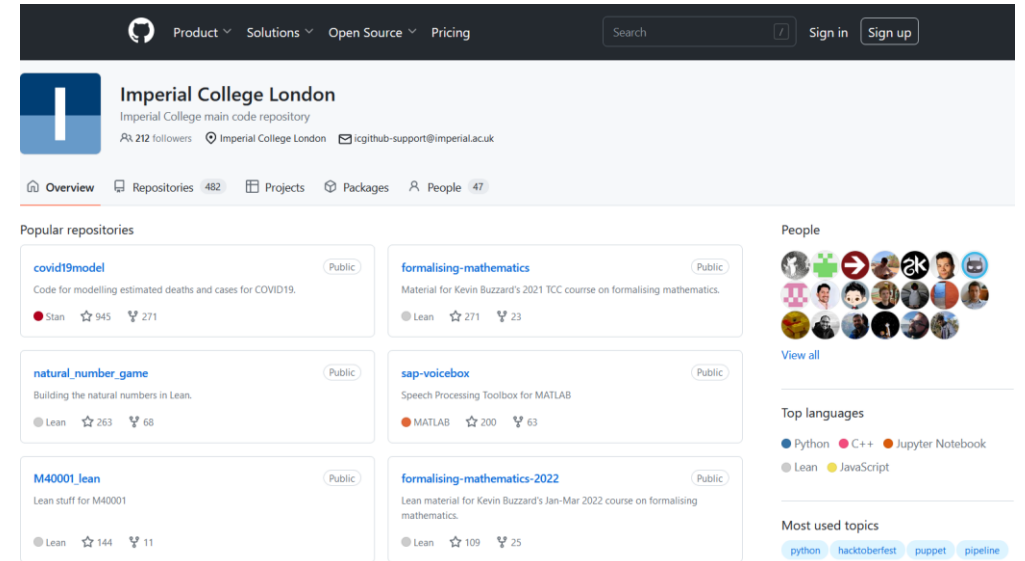# An introduction to Open Hardware

Professor Wouter Buytaert
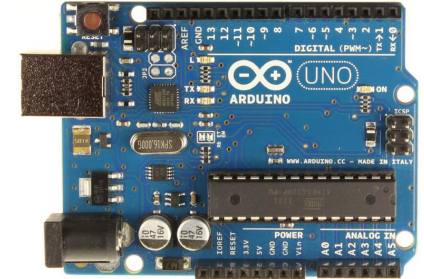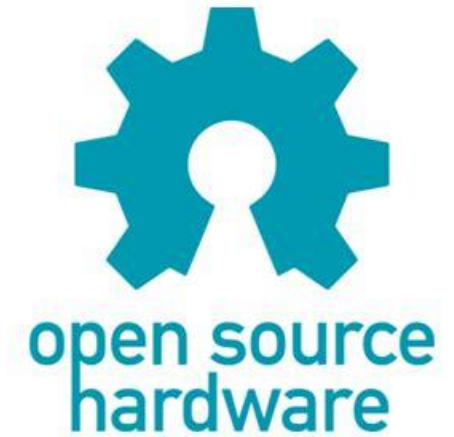
Imperial College London

Open science

Open source software

Open hardware

- Extending the concept of open software to electronic components and hardware design

- Share and make available:
  - o designs, schematics, plans, …
  - o Software: "firmware", libraries, developer tools and other resources
 - o Documentation, examples, videos, …

https://www.theguardian.com/science/political-science/2016/sep/07/can-the-open-hardware-revolution-help-to-democratise-technology

Arduino

A set of hardware components and tools to facilitate the development of embedded computing systems, consisting of:

- "boards" with a microprocessor
- "shields" to add specific functionality (sensors, storage, data transmission, …)
- An open source software development application (Arduino IDE)
- Software libraries
- Designs, tutorials, forums, and other web resources with information

https://www.arduino.cc/en/Guide/
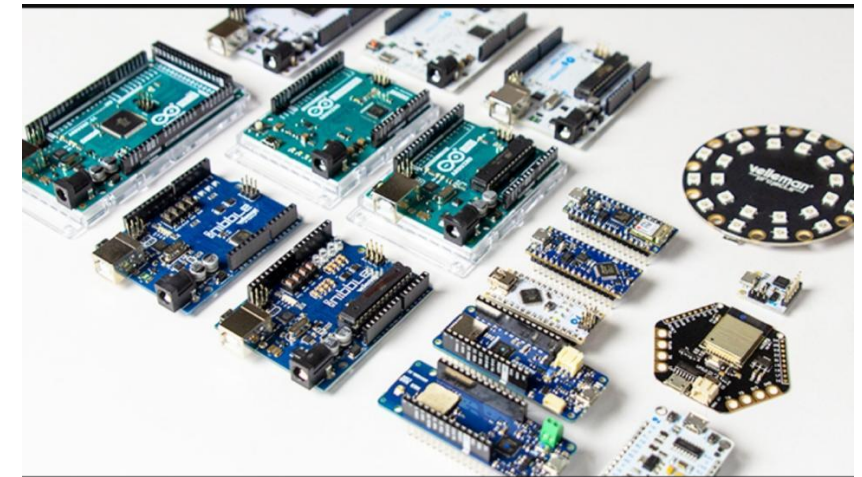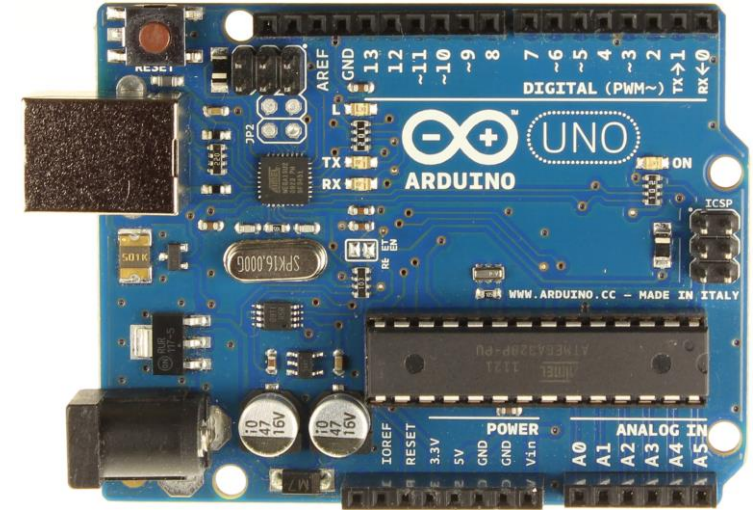
Arduino™ UNO Reference Design

Reference Designs ARE PROVIDED "AS IS" AND "WITH ALL FAULTS". Arduino DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, REGARDING PRODUCTS, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE

Arduino may make changes to specifications and product descriptions at any time, without notice. The Customer must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Arduino reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The product information on the Web Site or Materials is subject to change without notice. Do not finalize a design with this information.
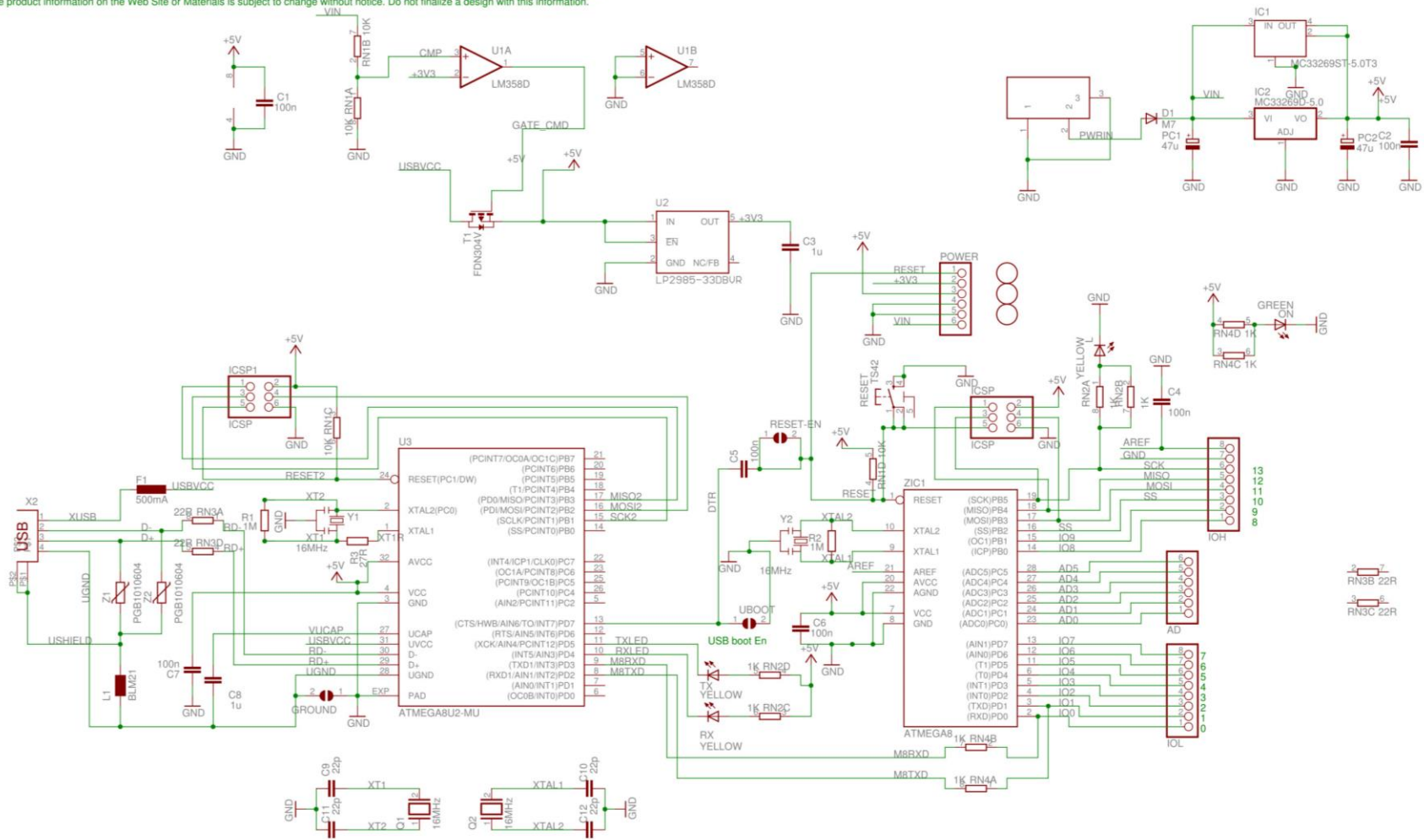
A vast range of "shields" and other components

Sparkfun.com
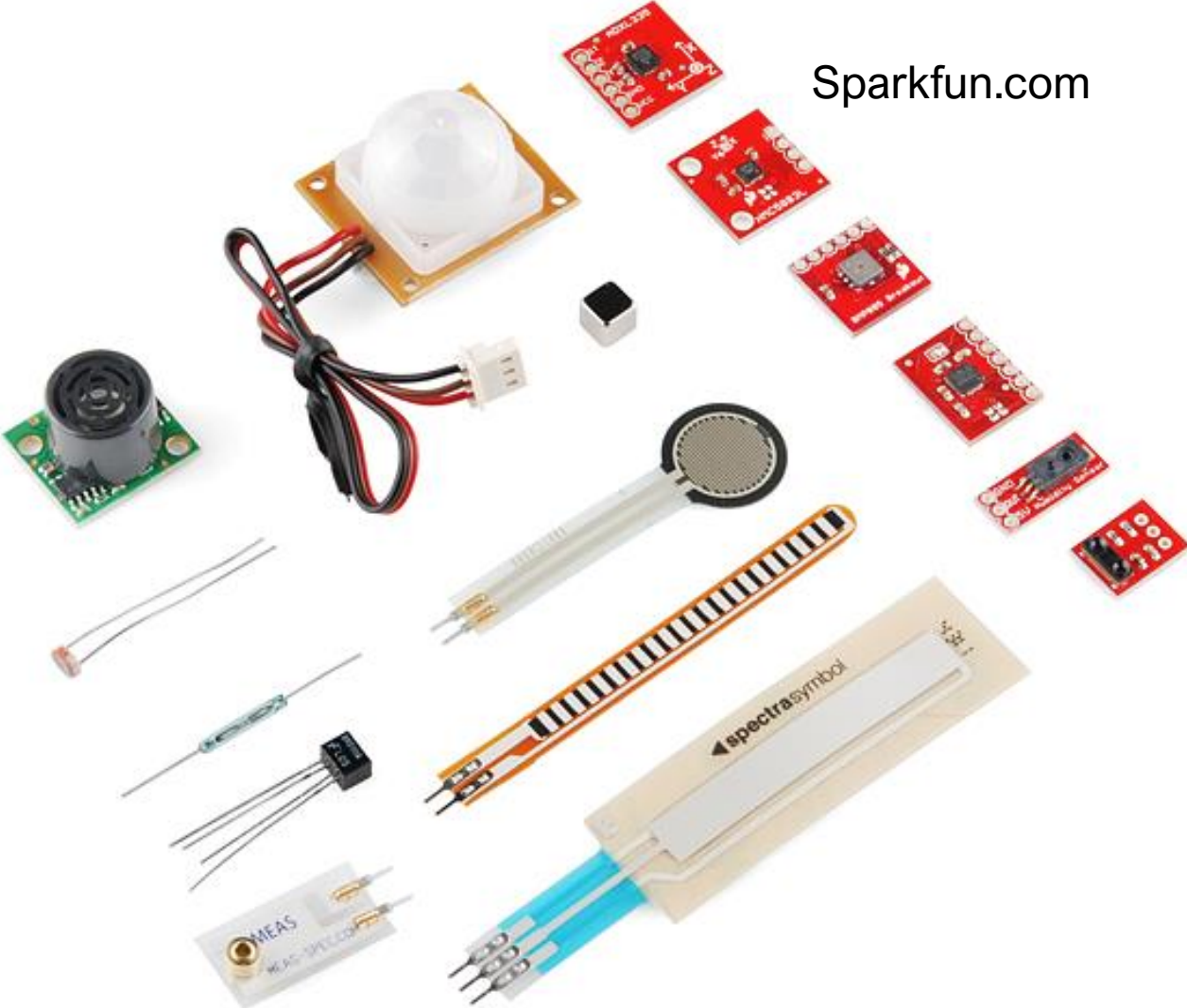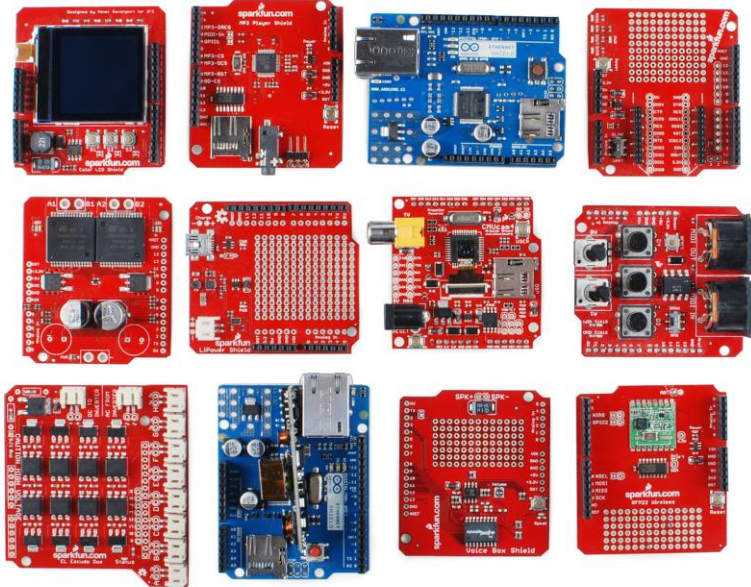
Sparkfun.com

Adafruit.com

Arduino

This org contains the official Arduino tools (IDE, CLI...), documentation and cores. See **@arduino-libraries** for the official libraries.

🔗 3k followers   🔗 https://www.arduino.cc   𝕏 @arduino   (Verified)

♡ Sponsor

🏠 Overview   🔲 Repositories 241   🔳 Projects   📦 Packages   👤 People 16

README.md

🤗 Welcome to the Arduino open source community!

This organization hosts the various open-source projects managed by the Arduino team, including:

- Tools
  - IDE: 1.x - 2.x
  - Command line: CLI - Lint - FWUploader
  - Misc: create-agent
- Language specification
  - Language discussions
  - Abstract API specification
  - Reference docs
- Cores: AVR - megaAVR - SAMD - SAM - Mbed - Renesas
- Library registry
- Documentation
  - docs.arduino.cc sources
  - support.arduino.cc sources
  - Built-in examples
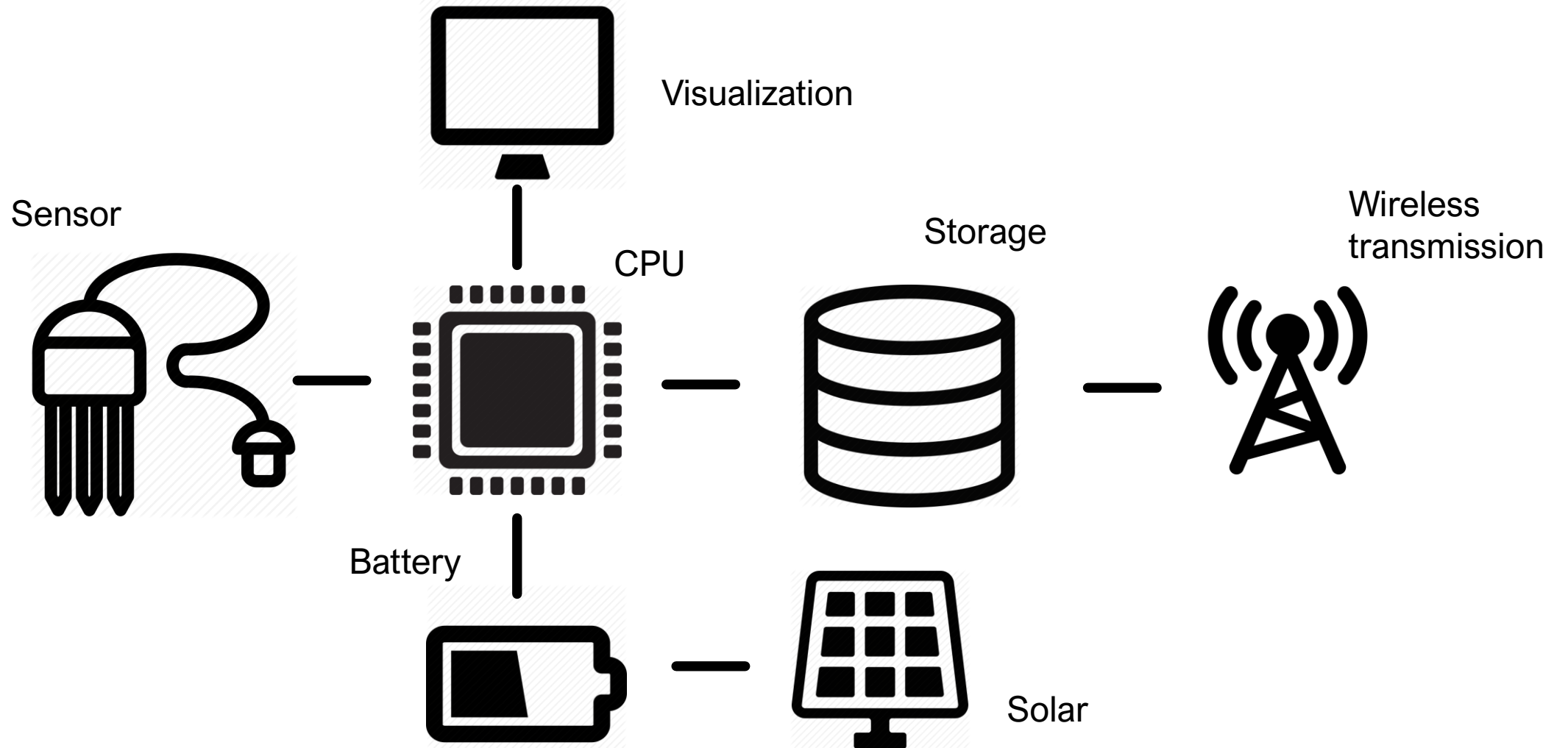- GitHub Actions: arduino-lint-action - compile-sketches - report-size-deltas

People
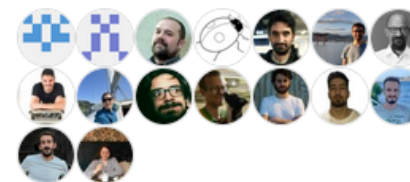
Sponsors
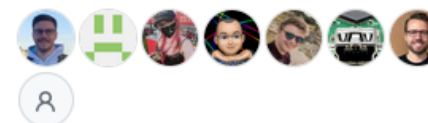
Top languages
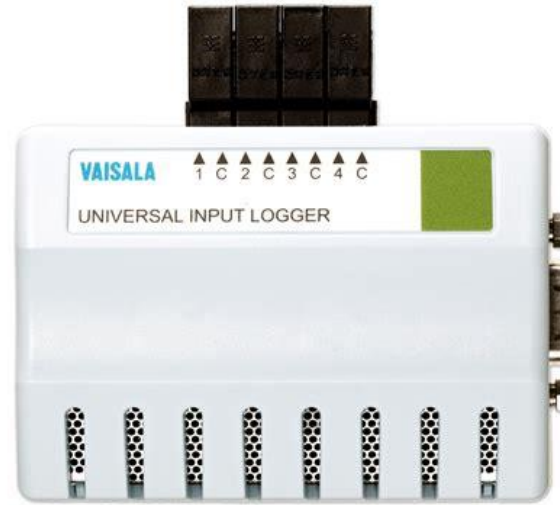
⚫ C   🔵 Go   🟡 JavaScript   🔴 C++

🔵 Python

Environmental logging solutions

Visualization

Sensor

CPU

Storage

Wireless transmission

Battery

Solar

Commercial solutions to environmental logging

A global "maker community"

https://thecavepearlproject.org/

https://github.com/NorthernWidget-Skunkworks

https://publiclab.org/riffle

https://stroudcenter.org/research/real-time-data/

Hydro Resilience:e
CITIZEN AND OPEN SCIENCENCE
FOR CLIMATE ADAPTATION ON

unesco
Intergovernmental
Hydrological Programme

Flanders
State of the Art

IMPERIAL

ICTP
The Abdus Salam
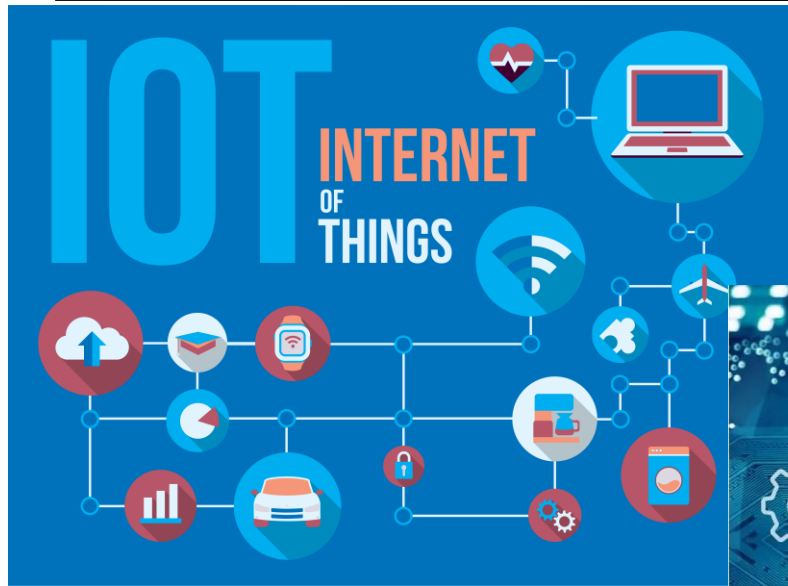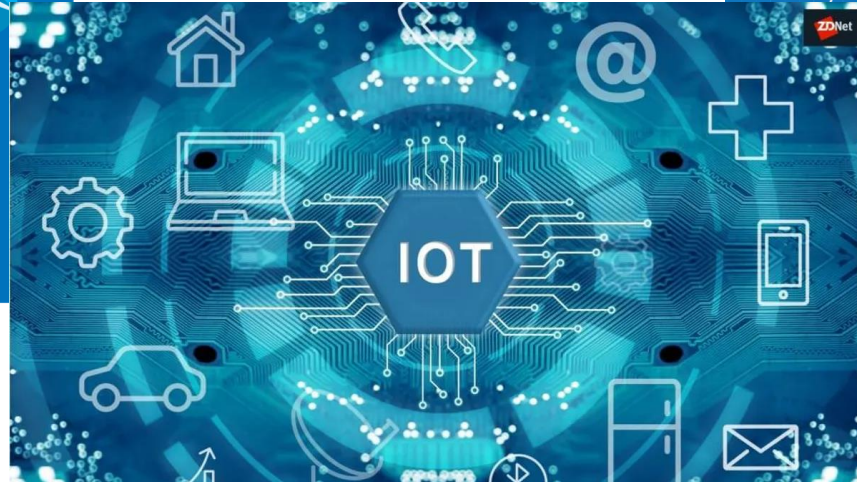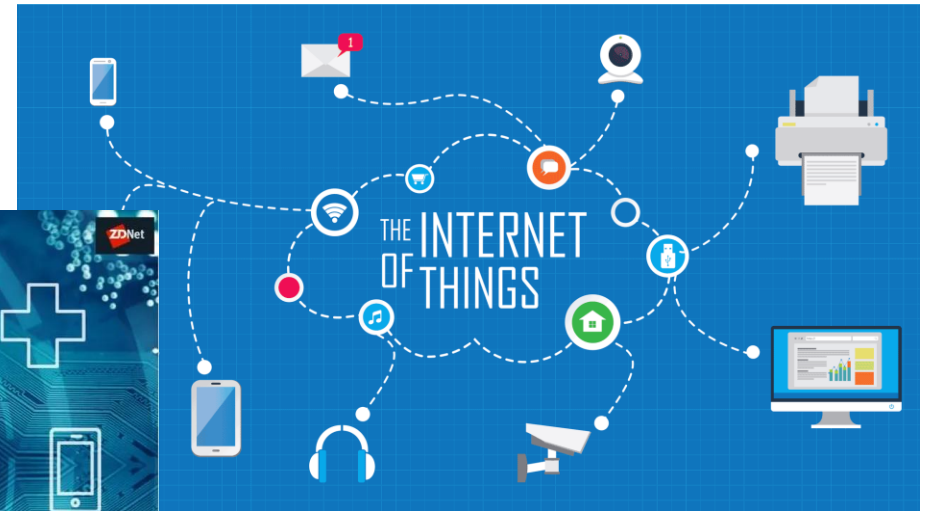International Centre
for Theoretical Physics

The Internet of Things

eoriginal.com

zdnet.com

medium.com

"a giant network of connected things and people – all of which collect and share data about the way they are used and about the environment around them" (IBM)