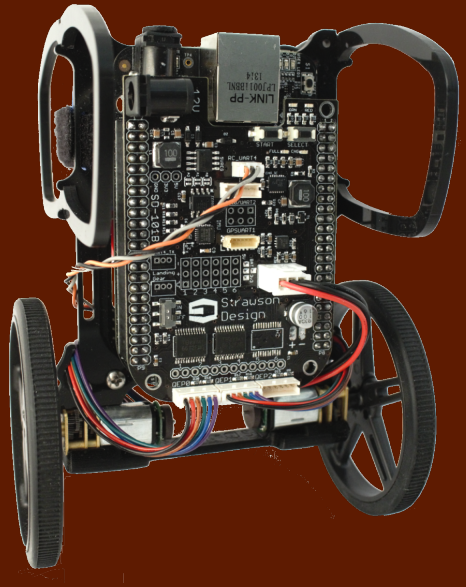
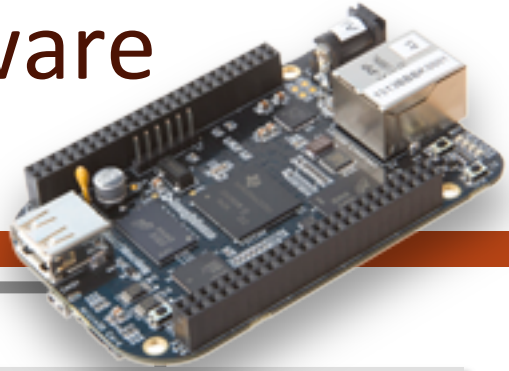


WHY IS BEAGLEBONE OPEN HARDWARE?

Jason Kridner, jkridner@beagleboard.org

BeagleBone Black: Open hardware computer for makers



Truly flexible open hardware and software development platform

All you need is in the box

Proven ecosystem from prototype to product

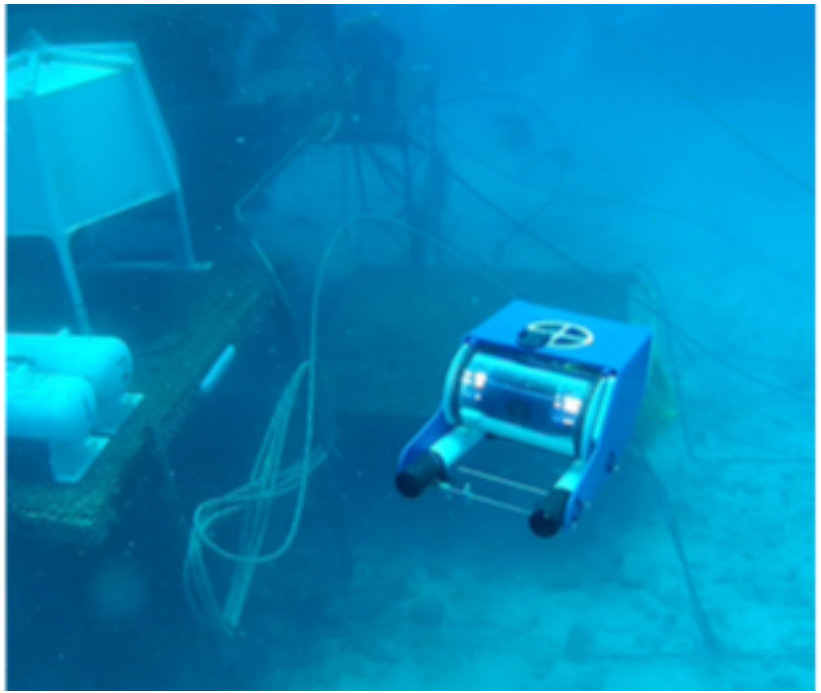
Most affordable and proven open hardware Linux platform available

beagleboard.org

BeagleBone Black

- Ready to use: ~$50
- 1 GHz performance and embedded microcontrollers
- On-board HDMI to connect directly to TVs and monitors
- 512MB DDR3
- On-board 4GB flash storage frees up the microSD card slot
- Support for Cape plug-in boards: http://beaglebonecapes.com

Example project: OpenROV



- Open-source underwater robot
- Community creating more accessible, affordable and awesome tools for underwater exploration
- Started by people wanting to explore an underwater cave
- Successfully Kickstarter'd

Open Source Hardware Principles

- Design publicly available for study, modification, distribution, making, and selling the design or hardware based on that design
- Source available in format for making modifications to it
- Ideally, open source hardware uses readily-available components and materials, standard processes, open infrastructure, unrestricted content, and open-source design tools to maximize the ability of individuals to make and use hardware
- Open source hardware gives people the freedom to control their technology while sharing knowledge and encouraging commerce through the open exchange of designs

http://www.oshwa.org/

Lessons from open source software

- Discover and address security and other flaws
- Alter to suit user wishes
- Use as basis for a new product

http://arstechnica.com/information-technology/2013/10/arduino-creator-explains-why-open-source-matters-in-hardware-too/

Mapping this to hardware

- "Because open hardware platforms become the platform where people start to develop their own products," Banzi told Ars.
- "For us, it's important that people can prototype on the BeagleBone [a similar product] or the Arduino, and if they decide to make a product out of it, they can go and buy the processors and use our design as a starting point and make their own product out of it."

http://arstechnica.com/information-technology/2013/10/arduino-creator-explains-why-open-source-matters-in-hardware-too/

BeagleBone Black Terms and Conditions

- Use design materials as you see fit, just don't blame
- No viral requirements unless you republish the materials
  - Materials licensed as CC-BY-SA
- Materials don't include the BeagleBoard.org logo, for which we expect a license
- Use of boards with BeagleBoard.org logo in commercial projects is discouraged
  - No enforcement, just a request
  - Interferes with planning parts and meeting individual user demand
  - Design may be adjusted to better suite community needs

http://elinux.org/Beagleboard:BeagleBoneBlack#Terms_of_Use

OSHWA checklist

- Comply with definition
- Allow study, modify, distribute, make and sell
- CC documentation w/o NC or ND
- OSHWA logo
- Own logos and trademarks
- Source file format
- Source files online
- Source files findable
- Able to copy
- Free
- Images in documentation
- Emotionally prepared
- Documentation of limits of openness

Importance to the hobbyist

- Longevity
- More detailed understanding
- Apply learning across more diverse platforms

Open hardware: The bits are free

open source hardware

- Allows you to customize the design
  - Alter both form and function

http://ninjablocks.com/

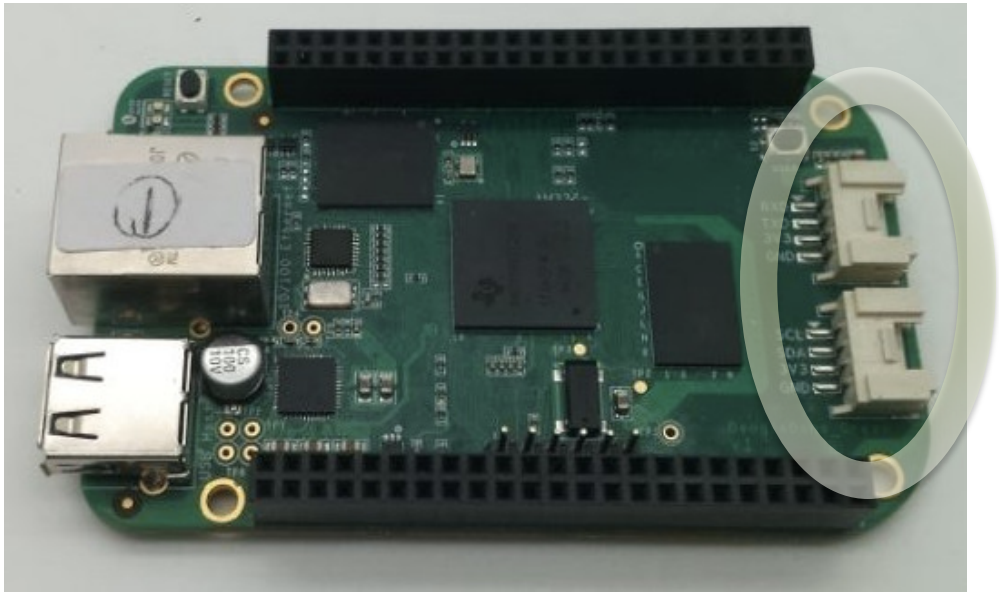
Arduino/BeagleBoard.org partnership

http://beagleboard.org/blog/2014-05-13-arduino-tre-developer-program/

beagleboard.org

BeagleBone Green adds connectors

Cape or manual wire no longer required

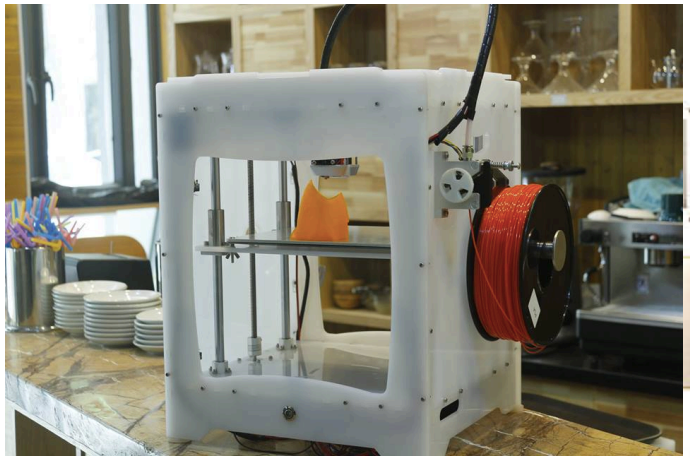


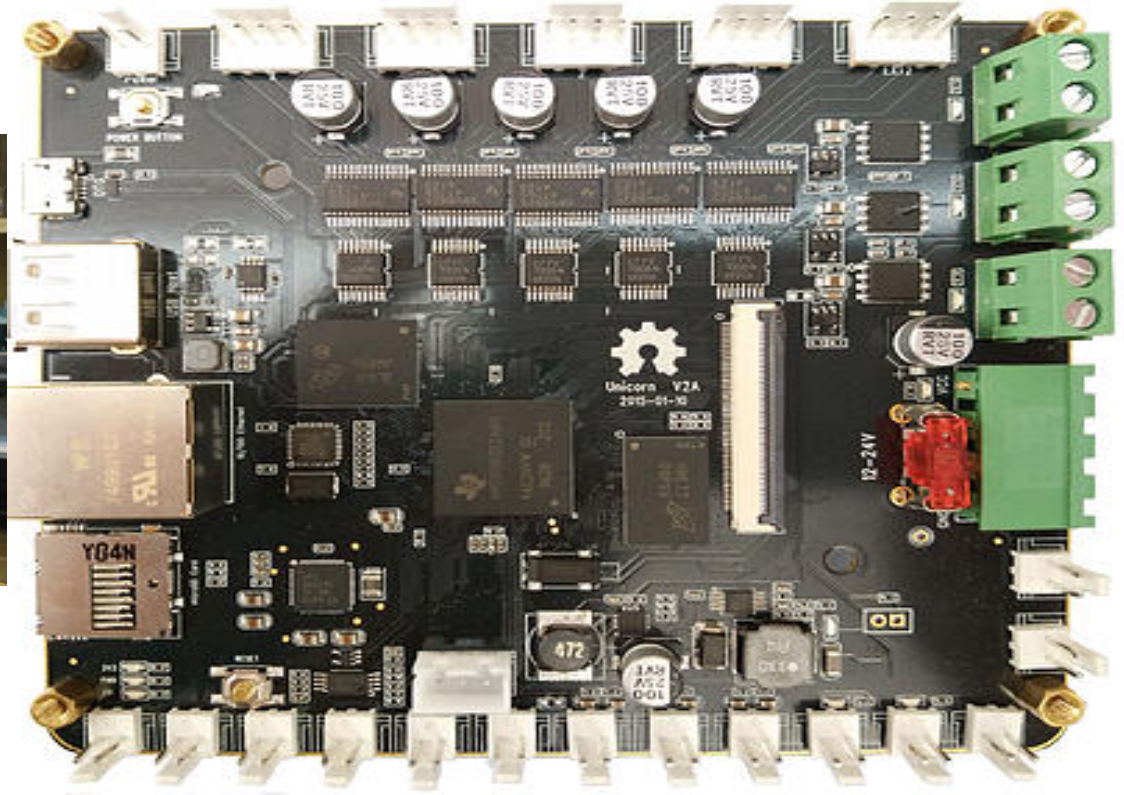
http://beagleboard.org/green

beagleboard.org™

FastbotBBP: machine controller

http://bit.ly/beagleprinter

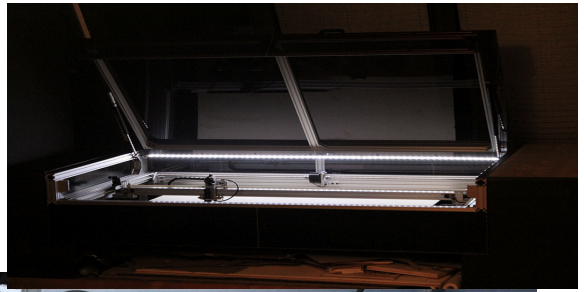


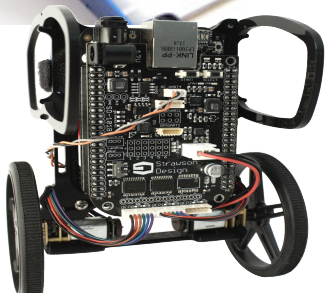


Beagle's open future

- Continued improvement of open software support
  - Mainline kernel support
  - GCC support for PRUs
    - Additional tools to make PRUs easier to use
- Making derived capes and platforms easier
  - Upverter... CircuitHub.com...
  - Stay tuned!

Envision: Apps becoming appliances

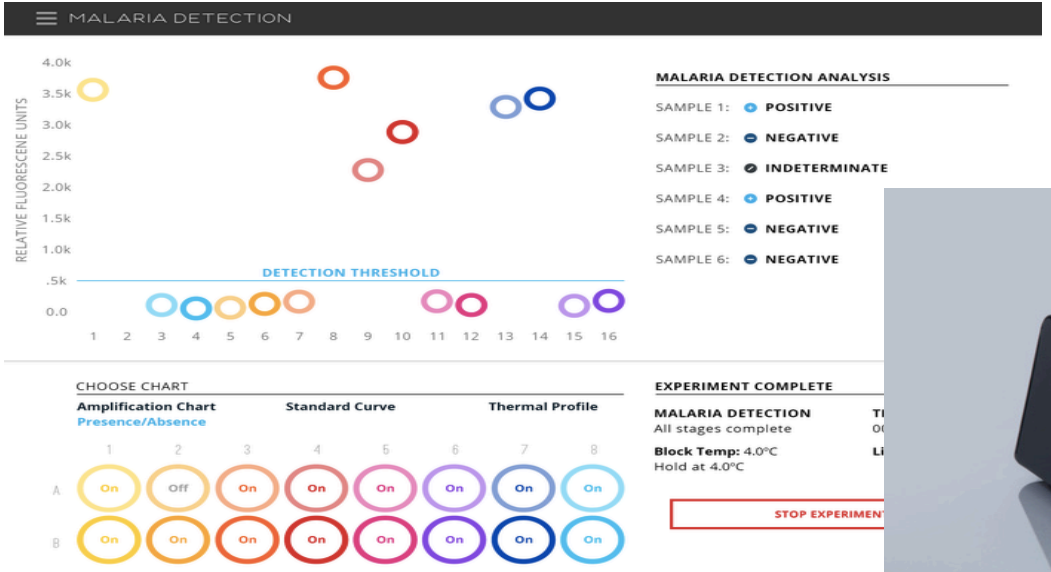




beagleboard.org

Open qPCR

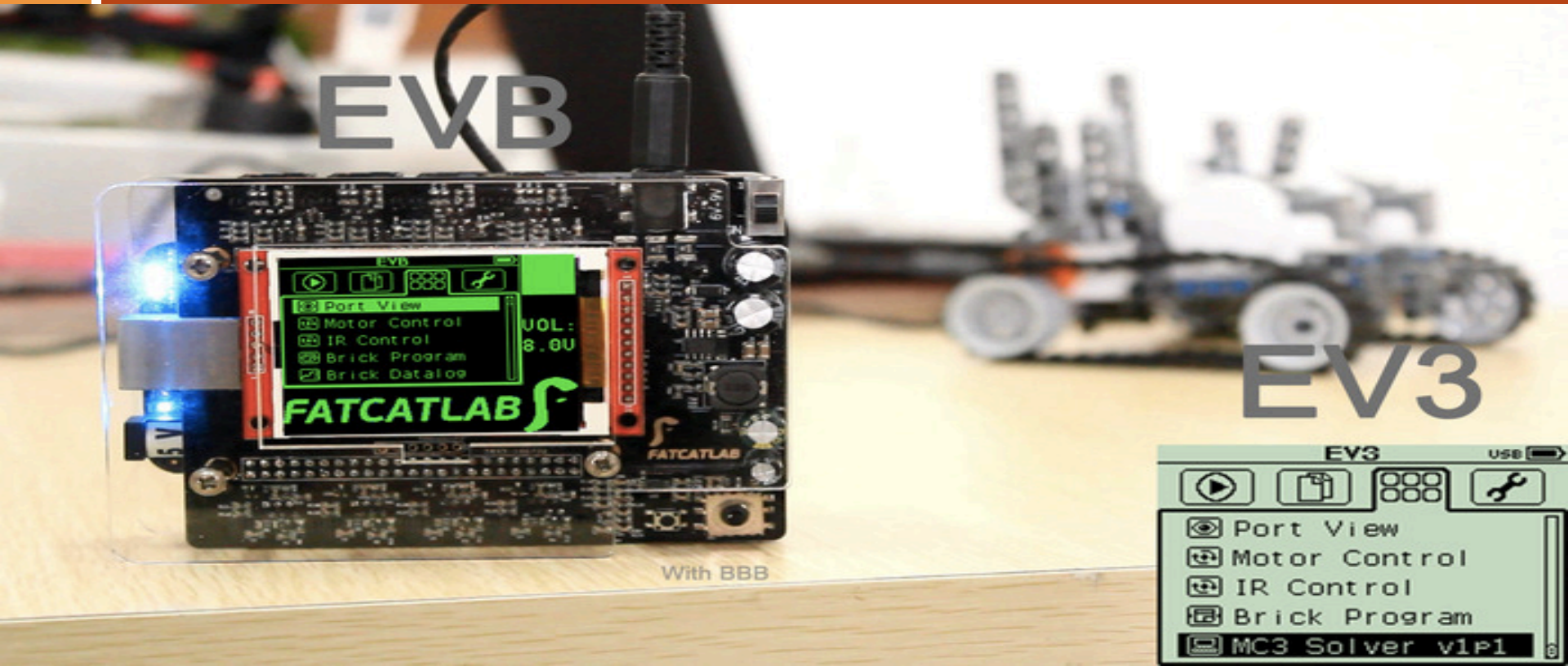
DNA Diagnostics for Everyone



OpenROV

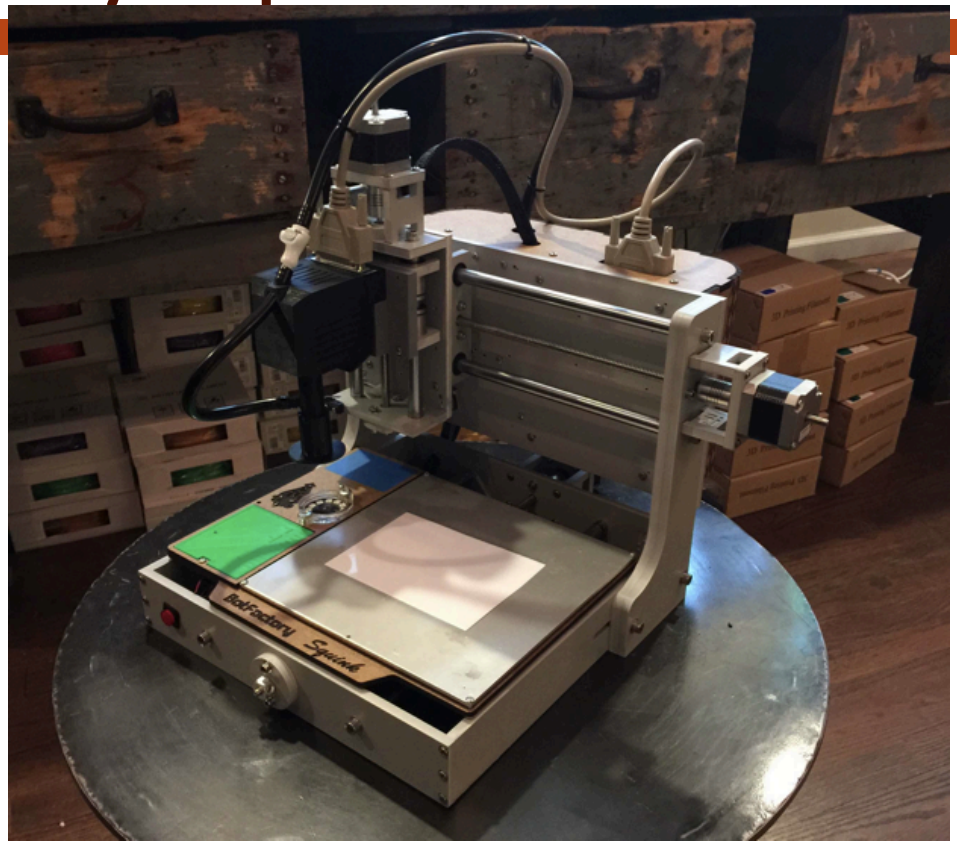
Open source underwater robots for exploration and education

LEGO EV3 and derivatives



POURSTEADY
FREE COFFEE!
SIGN UP
TIPS

BotFactory Squink



Shopbot

- Check them out and ask

Check your platform for “open”!

- Know where the openness ends
- Support open platforms with projects
- Support derivative works that best compliment the platform ecosystem
- Research the history and future of your platforms
  - You are the most valuable part of the platform!

Thanks

open source hardware

@jadon