



Open Source Hardware Isn't Hard

Toni Klopfenstein

<https://github.com/ToniCorinne/OpenSource101>

Overview

- Who am I?
- History of Open Source Hardware (OSHW)
- What is Open Source Hardware?
- Pros/Cons of OSHW
- Current State of the OSHW Community
- How to Get Involved
- Q/A

Why am I here?

- Employee @ SparkFun Electronics 2011-Present
- OSHWA Board Member 2014-2016
- Open Hardware Summit Sponsorship Chair 2015-2016
- Open-source participant

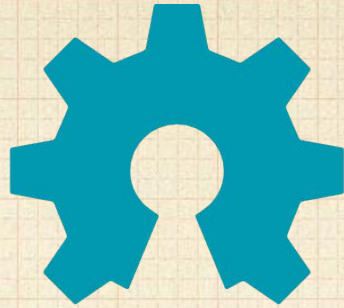


Photo by: [Joel E. B.](#)

History of OSHW

- Open Hardware Certification - 1997
- First Hardware Specific License - TAPR, 2007
- Open Source Design and Hardware Alliance - Certification work in 2009
- First Open Hardware Summit - 2010
- Open Source Hardware Definition 1.0 - 2010
- CERN Open Hardware License - 2011
- Logo Disputes - 2011
- OSHWA Officially Organized - 2012
 - Received non-profit tax status - 2014

Open Source Hardware Definition:



open source
hardware

“Open source hardware is hardware whose design is made publically available so that anyone can study , modify, distribute, make, and sell the design or hardware based on that design. ”

Source: <http://www.oshwa.org/definition>,
<http://www.oshwa.org/open-source-hardware-logo/>

Criteria:

- Documentation
- Scope
- Necessary Software
- Derived Works
- Free Redistribution
- Attribution
- No Discrimination Against Persons or Groups
- No Discrimination Against Fields of Endeavor
- Distribution of License
- License Must Not Be Specific to a Product
- License Must Not Restrict Other Hardware or Software
- License Must Be Technology Neutral

Source:

<http://www.oshwa.org/definition>




























Cons

- Diligence is required
- Enforcement of licenses can be difficult
 - Costs time, money
- Isn't always successful
- Cease and Desists
- Licensing is hard
 - MIT
 - Creative Commons
 - CERN OHL
 - GNU GPL
 - TAPR OHL
 - BSD

Cons

- Success = you will be cloned

Hot sell

| | | | | | | | | |
|--|--|---|---|---|--|--|---|--|
|  <p>A4988 Stepper Motor Driver Module 3D Printer</p> <p>1.50 USD Buy It Now</p> |  <p>1pcs USA US to Europe EU plug changer power</p> <p>0.99 USD Buy It Now</p> |  <p>100pcs StepStick Pololu stepper driver A4983</p> <p>150.00 USD 180.00 Buy It Now Free shipping</p> |  <p>SIMCOM SIM900 Quad-band GSM GPRS Shield</p> <p>29.99 USD Buy It Now Free shipping</p> |  <p>Geeetech Stepper Motor EasyDriver step motor</p> <p>1.98 USD Buy It Now</p> |  <p>CY7C68013A EZ-USB FX2LP USB2.0</p> <p>12.99 USD Buy It Now Free shipping</p> |  <p>PL2303 USB To RS232 TTL Converter Adapter</p> <p>2.90 USD 4.65-USD Buy It Now</p> |  <p>Geeetech New Pro Mini ATmega168 5V 16MHz</p> <p>2.50 USD 4.60-USD Buy It Now</p> |  <p>100pcs StepStick DRV9825 Stepper Driver</p> <p>188.00 USD 338.00 Buy It Now Free shipping</p> |
|  <p>Nema 17 Stepper Motor 2 Phase with cable for</p> <p>14.00 USD Buy It Now Free shipping</p> |  <p>Cubietech Cubietruck Cubieboard3 Allwinner</p> <p>85.00 USD Buy It Now Free shipping</p> |  <p>Geeetech RS232 Serial To TTL Converter</p> <p>5.40 USD Buy It Now Free shipping</p> |  <p>2 pcs 700 Point Breadboard Bread</p> <p>5.99 USD Buy It Now Free shipping</p> |  <p>Geeetech Iduino NANO V3.0 ATmega328 Board</p> <p>6.00 USD 6.69-USD Buy It Now Free shipping</p> |  <p>Geeetech LM2596 DC Power Step Down</p> <p>2.50 USD Buy It Now</p> |  <p>4pcs Endstop limited switch with cable for 3d</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>Xbee USB Adapter Module With Mini USB</p> <p>9.99 USD 12.80-USD Buy It Now Free shipping</p> |  <p>Geeetech CD74HC406 Analog Digital MUX</p> <p>4.49 USD 6.80-USD Buy It Now Free shipping</p> |
|  <p>MP2 Music V3.052B</p> <p>2.99 USD 3.99-USD Buy It Now</p> |  <p>Geeetech New Pro Mini ATmega168 5V 16MHz</p> <p>2.50 USD 4.60-USD Buy It Now</p> |  <p>Geeetech MP11605B</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>New 20cm 40pin GPIO</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>White robot BB</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>B5Pcs DupleX Lumina</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>Smoko Pac Sanger</p> <p>1.99 USD 2.99-USD Buy It Now</p> |  <p>Geeetech Pro Mini ATmega168 5V 16MHz</p> <p>2.50 USD 4.60-USD Buy It Now</p> |  <p>Ultra Sonic range</p> <p>1.99 USD 2.99-USD Buy It Now</p> |

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Welcome to Newsmart Communication HongKong Co., Limited: We are a resistance and capacitor Manufacturer in China. Our factory started in year 2003, our factory has become the professional buyer's best

We have many long-term customers in overseas including: USA,UK,German, France, Japan, Israel,Mid-east,Russia,Brasil etc. Also, the customers will get supports from us and to get more shares of their own

Newsmart Communication HongKong Co., Limited also has large stocking distributor of resistance and capacitor,especially for locating hard-to-find electronic components. We offer a wide range of support services and businesses well.

We offer product and services like: procurement of hard-to-find, allocated, or obsolete electronic components on global basis from our customers database. We have our own parts search engine: worldwide the greatest time management solution and simplify your business.

CONTACT US TODAY AND GET OUR SUPPORT TO HELP YOUR BUSINESS IN FUTURE.



- Freetronics Experimenter's Kit



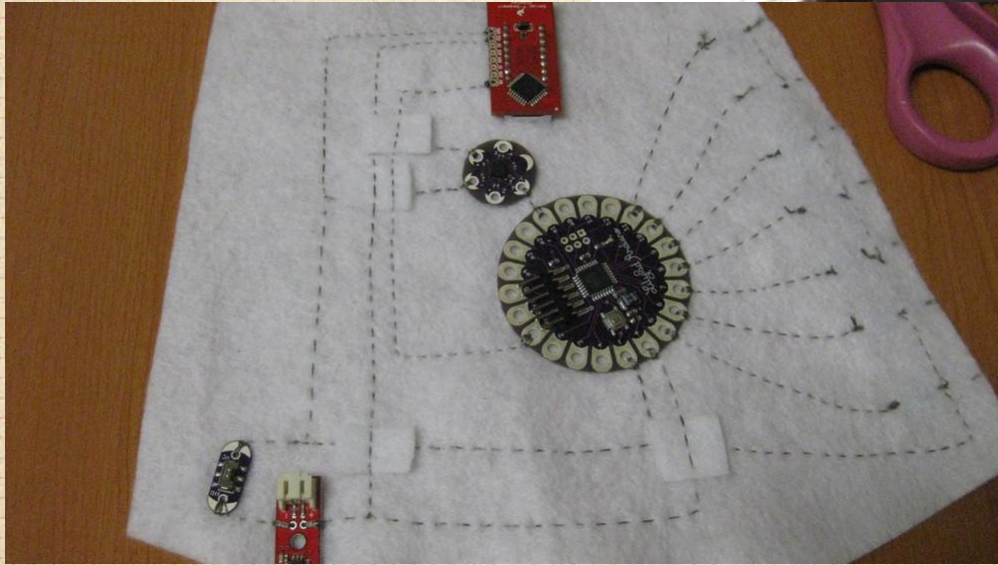
- Duplicated by Duinotech/Jaycar



Pros

- Save Money on Patent Filings
 - Can easily be >\$10K
 - Source: <https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule>
- Save Money on Patent Litigation Suits
 - Can easily be >\$100K
 - Source: <http://files.ctctcdn.com/e79ee274201/b6ced6c3-d1ee-4ee7-9873-352dbe08d8fd.pdf>
- Drives Innovation
- Drives a Better Customer Experience
- Allows for Crowd-Sourcing Improvements
- Free Advertising
- Community Support
- Encourage Repair/Reuse
- Supports Consumer Rights

D&D Bracer



- Demo Project
- 7 Separate Products

Source: <https://learn.sparkfun.com/tutorials/dungeons-and-dragons-dice-gauntlet>

role playing dice gauntlet – fur style



Role Playing Dice Gauntlet – Fur Style 

- Actualized Product
- Didn't Affect Our Sales

Current State of the Community

- Citizen Science
 - [Public Lab](#)
 - [Open Source Beehives](#)
- Ecology
 - [Open Source Ecology](#)
 - [FarmBot](#)
- Communications
 - [PirateBox](#)
 - [Fairphone](#)
- Textiles
 - [Open Knit](#)
 - [FabTextiles](#)
- Bio
 - [Open Hand Project](#)
 - [Open Bionics](#)
 - [Open Prosthetics](#)
 - [OpenBCI](#)
 - [Four Thieves Vinegar](#)
- Furniture/Housing
 - [OpenDesk](#)
 - [WikiHouse](#)
- Machines
 - [Open-Source Vehicle](#)
 - [Open ROV](#)

- Electronics/Fabrication

- [SparkFun](#)
- [Seeed](#)
- [Arduino](#)
- [Adafruit](#)
- [Teensy](#)
- [Minnowboard](#)
- [ProtoCentral](#)

- [LulzBot](#)
- [SeeMeCNC](#)
- [Handibot](#)
- [Open-Electronics](#)

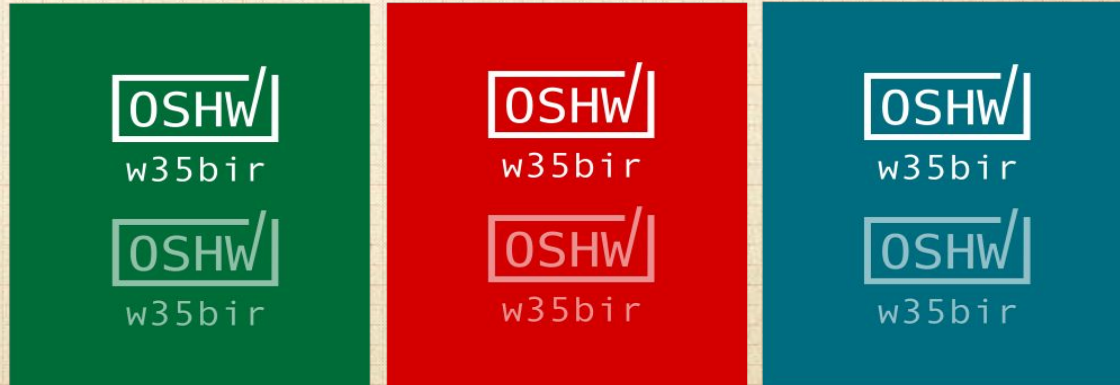
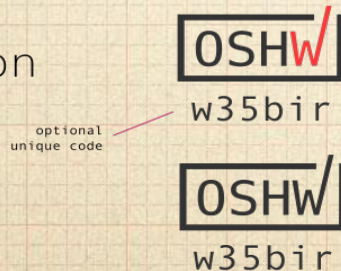
Events of the Community

- [Open Hardware Summit](#)
 - Varied locations, (end of Summer)
- [DEF CON](#)
 - Las Vegas, July
- [HOPE](#)
 - NYC, Biennial (2018)
- [SparkFun Autonomous Vehicle Competition](#)
 - Boulder, Fall
- [Hackaday SuperCon](#)
 - California, November
- [Maker Faires](#)
 - Worldwide, year round
- [Hackerspace Events](#)
 - Worldwide, year round

Hardware Certification

- <http://certificate.oshwa.org/>
- Launched in 2016
- Updated yearly
- Self-certify as open
- Enforced by OSHWA

OSHWA
Open Source
Hardware
Certification
Logo



Certification Directory

| | | | | | | | | |
|----------|--|---|---|---|----------------------------------|-------|-----|------------------|
| MX000002 | Parabolic Electronically Positioned Solar Hot Water Heater | A parabolic solar hot water heater for industrial, restaurant, hotel, etc. use | http://www.appropedia.org/Parabolic_Solar_Hot_Water_Heater | http://www.appropedia.org/Parabolic_Solar_Hot_Water_Heater | info@fundacionanisa.org | | 1 | Pa |
| NZ000001 | OneRNG | An open hardware random number generator | https://github.com/OneRNG/ | http://onerng.info/ | paul@taniwha.com | | 2 | |
| | | When kid watching TV on intere To Safe kid's health eyes vision Switch off video signal and give And parent can adjustable red z We hope this device can help m | | | | | | |
| TH000001 | KidCareTV | Please safe our kid eyes vision | https://bitbucket.org/emone_th/kidcare | https://www.facebook.com/emone.th | info@emone.co.th | 1.0.0 | | Ki |
| UK000001 | ColorHug | A display colorimeter | http://www.hughski.com/faq.html#openhardware | http://www.hughski.com/ | info@hughski.com | | 2 | Ca |
| UK000002 | Europi | Eurorack sequencer and interface modules based around a Raspberry Pi | https://github.com/AudioMorphology/Europi | | richard.goodwin@morphology.co.uk | | 1 | Eu sy 1 se |
| UK000003 | CE003 Expanding & Dis | Design and calculations for an e | www.creativenergie.co.uk/services/r | www.creativenergie.co.uk | gareth@creativenergie.co | Rev02 | | en |
| UK000004 | Nixie Pipe | a modern day Nixie tube | https://github.com/tuna-f1sh/nixiepipe | www.nixiepipe.com | oshwa@jbengineering.co | | 1.4 | Illu |
| US000001 | OpenLog | Open Source Hardware Datalogger | https://learn.sparkfun.com/tutorials/openlog-hookup-guide | https://www.sparkfun.com/products/13712 | support@sparkfun.com | v15 | | El |
| | | Documentation: | | | | | | |

How Can You Participate?

- Solve problems yourself
 - Fork open-source solutions and make the world better
- Contribute to ongoing projects
 - Check GitHub, Hackaday, Instructables, local hackerspaces
- Certify your projects
- Document, document, document!
- Learn the licenses and teach others
- Write open-source software
- Support with your wallet
 - [Tindie](#), [inMojo](#)
- Ask questions

Thank You!



Questions?

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