

Open Source Embedded Computing

James Lee

The George Washington University

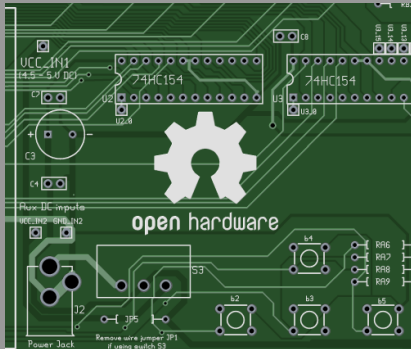
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A Brief History

- ▶ Generally refers to software whose source is available for viewing, tweaking, modifying, copying, sharing, etc.
- ▶ Been around for about as long as people have had the means of sharing it.



What About Open Source Hardware?



- ▶ Building hardware is really expensive.
- ▶ Hardware isn't copyrightable.
- ▶ “Because copying hardware is so hard, the question of whether we’re allowed to do it is not vitally important. I see no social imperative for free hardware designs like the imperative for free software.” – Richard Stallman

Rockbox



- ▶ Features $\Rightarrow$ <http://www.rockbox.org/wiki/WhyRockbox>
- ▶ Ports!
- ▶ A case study:
 - <http://www.rockbox.org/wiki/IaudioX5Info>
 - <http://www.rockbox.org/wiki/IaudioX5HardwareComponents>
 - <http://www.rockbox.org/wiki/IaudioReverseEngineering>
 - <http://www.rockbox.org/wiki/IaudioX5FirmwareDisassembly>

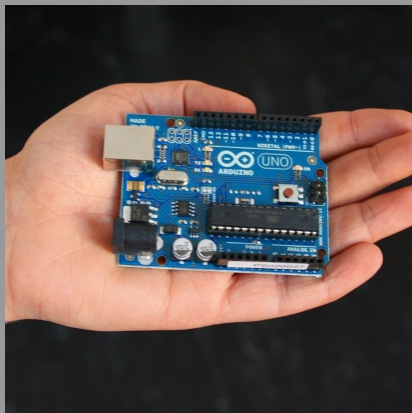
Rockbox

Rockbox faces threats from:

- ▶ Signed and encrypted firmware
- ▶ Systems-on-Chip
- ▶ Cell phones

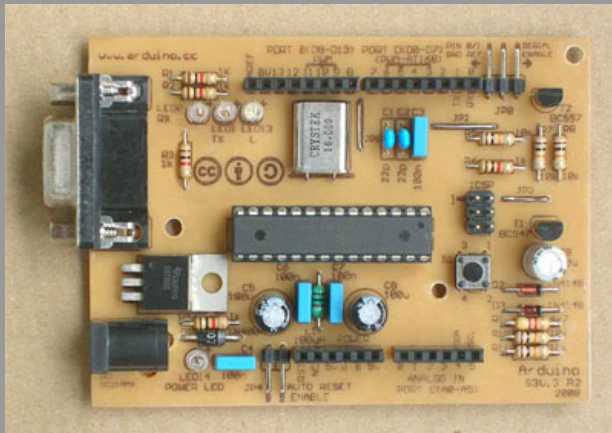


Arduino



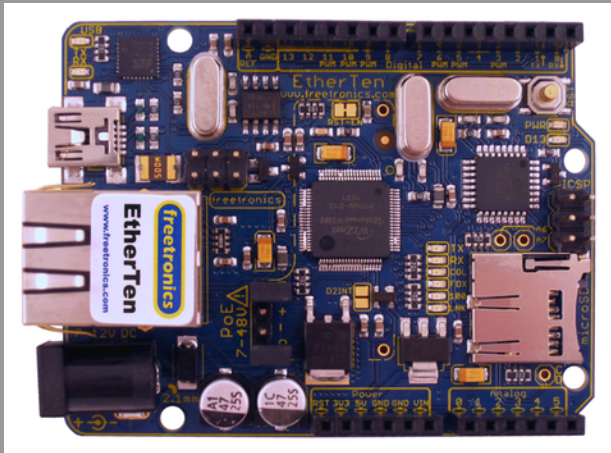
- ▶ Lots of innovative projects:
<http://makezine.com/arduino/>

Build Your Own



<http://arduino.cc/en/Main/ArduinoBoardSerialSingleSided3>

Or Buy a Better One



<http://www.freetronics.com/products/etherten>

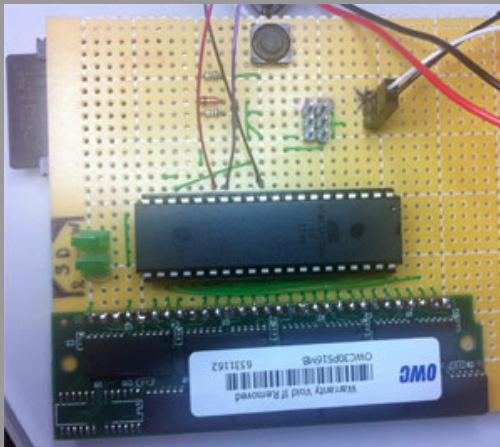
Arduino and Android

- ▶ Use the Android Open Accessory API
- ▶ Apps and hardware can work together
- ▶ Home automation



<http://arst.ch/pez>

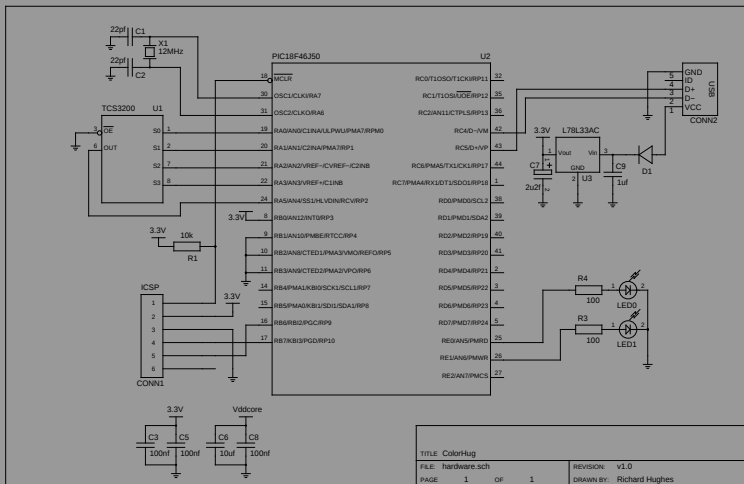
Linux on an 8-bit Microcontroller



ColorHug



Open Source Display Colorimeter



Other Notable Examples

- ▶ Raspberry Pi
- ▶ OLPC
- ▶ OpenMoko

