

Open Source Hardware

An introduction

Javier Serrano

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- 1 Logistics
- 2 What is OSHW?
- 3 Why OSHW?
- 4 How to do OSHW?
- 5 Conclusions

Outline

- 1 **Logistics**
- 2 What is OSHW?
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Logistics

Wireless Internet access

Login: visitor

Password: ICALEPCS

Keep it informal but. . .

- Wait for the end of talks, the breaks or the discussion session to ask questions.
- Take the mic to talk.
- Respect vendor stands and tables during coffee and lunch breaks.

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There is an OSHW definition!

Check out <http://freedomdefined.org/OSHW>

- Made by the same people who organize the OH Summit. See Tom's talk.
- Inspired by the Open Source definition for software.
- Focuses on ensuring freedom to study, modify, distribute, make and sell designs or hardware based on those designs.
- Now we know exactly what we mean when we say OSHW!

There are licences compatible with it

- E.g. CERN Open Hardware Licence. But there are others, like TAPR OHL and the CC family.
- See Myriam's talk.

There are many successful OSHW projects

Arduino is probably the best known

- Huge community.
- A source of inspiration for many people.
- See David's talk.

Designs hosted in www.ohwr.org

- See Erik's talk on CERN designs.
- See Brandon's talk on Rhino.

And many many others... (see e.g. Pascale's talk on Soleil designs).

Many companies already do it

Have designed OSHW

- Creotech (see Greg's presentation).
- Seven Solutions (see Eduardo's presentation).
- Facebook (see John's presentation).

Are seriously considering it

- National Instruments (see Ravi's presentation).
- I-Tech (see Borut's presentation).

And many many others. . .

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Reasons for OSHW (designers)

Avoid duplication

How many people are designing a 100 MS/s ADC board just in the ICALEPCS community right now?

Get peer review and help

- From companies.
- From colleagues in other labs and universities.
- From great people you don't know!

Tackle more ambitious projects

Imagine what the people in this room could do if working together. And that's very few people!

Reasons for OSHW (companies)

Peer review

Have other people, including your clients, help you in the design. Compensate your weak areas with external help.

Lower entry barriers

Enter a new market with almost no risk.

Build hybrid solutions

Complement your proprietary product line with OSHW gear and sell complete integrated systems.

Reasons for OSHW (clients)

No vendor lock-in, resulting in

- Vendors selected solely on their proficiency and quality of support.
- Reasonable prices.
- Easier management of obsolescence.

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Put your stuff online!

E.g. in the Open Hardware Repository

- A complete web-based collaborative environment made of FOSS itself.
- Best practice is to make it much more than a dump for design files: explanations, specifications, mailing list discussions. . .
- Version control for code (HDL, firmware. . .) but also for schematics, PCB layout, etc.

Use an OSHW definition-compliant licence

E.g. the CERN OHL

- Give lots of freedom to licensees.
- Ensure modifications are fed back to the community.
- Deal properly with liability.

Try to use FOSS tools for development

For gateware

- Simulation: Icarus Verilog, GHDL. . . See Pawel's talks.
- Synthesis and P&R?! See Sebastien's talk.

For PCB design

- gEDA: see Larry's presentation.
- Kicad: see Dick's presentation.
- Are we there yet? See Tom's presentation.

Find a good commercial model

Companies are your friends

- Expertise.
- Guarantee.
- Support.
- All these things are worth money! Can we change our mindset?

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Some remarks before moving on

- Don't hesitate to challenge, ask, discuss. . . This is a workshop, on a very new paradigm.
- Have fun!