Why Do We Need a Journal for Open Hardware?

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Why do we need yet another journal?

- Help advance a culture of Free and Open Source development and sharing in academia!

- <u>For Community-based projects:</u> peer-review and preservation for hardware documentation, providing a public, indexed deposit as an alternative to patenting

- <u>For Scientific instrumentation projects</u>: create strong incentive for academics to release their hardware as a peer-reviewed publication, guiding solid documentation practices for wider reproducibility

- Create interfaces between academic and community-based <u>Open Science hardware development</u>

Journal of Open Hardware

- Created after GOSH 2016 at CERN in Geneva

- Forum for academic researchers, community members, and hardware professionals

- Dedicated OA publication format for Open Hardware

- Peer-review and long-term preservation for hardware documentation

- Community control over its governance, content, pricing, and platform development in fair partnership with:

]u[ubiquity press
open scholarship

Arduino-like Development Kit for Single-element Ultrasound Imaging

Luc Jonveaux [1]

An open-source software ecosystem for ultrasound imaging is widely available to developers, however, limited resources can be found on the open hardware side. The focus of this work was to develop an easy-to-use platform kit (hardware and software) for providing the community a complete experimental setup for ultrasound imaging at a low cost, without the need for expensive and non-modifiable specific equipment. The goal of this work resembles the needs of medical systems in the 80's where analog techniques using single-sensor devices were prominent. To this end, two open-source, arduino-like modules have been developed for building a simple, yet complete, single-channel analog front-end system, where all the intermediary signals are readily accessible by the user. The modules were tested using re-purposed ultrasound mechanical probes, as well as non-medical transducers. Furthermore, different digital acquisition systems were utilized for providing the images of interest. The developed modules can also be used in Radio Frequency (RF) projects, non-destructive testing and control projects, as well as in low-cost medical imaging projects on non-living samples.

(1) independent maker

Emerging Business Models for Open Source Hardware

Joshua M. Pearce [1]

The rise of Free and Open Source models for software development has catalyzed the growth of Free and Open Source hardware (also known as "Libre Hardware"). Libre hardware is gaining significant traction in the scientific hardware community, where there is evidence that open development creates both technically superior and far less expensive scientific equipment than proprietary models. In this article, the evidence is reviewed and a collection of examples of business models is developed to service scientists who have the option to manufacture their own equipment using Open Source designs. Profitable Libre Hardware business models are reviewed, which includes kit, specialty component, and calibration suppliers for makers. The results indicate that Libre Hardware businesses should target technically sophisticated customers first and, as usability matures, target expanded markets of conventional consumers.

(1) Michigan Technological University

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Gathering for Open Science Hardware

Shannon Dosemagen[1], Max Liboiron[2] and Jenny Molloy[3]

Without hardware, there is no science. Instruments, reagents, computers, and lab equipment are the platforms for producing systematic knowledge.   Yet, current supply chains limit access and impede creativity and customization through high mark-ups and proprietary designs. This can be compounded by private hardware licenses and patents. Open Science Hardware (OSH) addresses part of this problem by sharing designs, instructions for building, and protocols . Expanding the reach of Open Science Hardware within academic research, NGO initiatives, citizen science, and education has potential to increase access to experimental tools and facilitate their customization and reuse while lowering costs. A growing number of people and organizations around the world are developing and using Open Science Hardware, but a coherent, self-organizing community has yet to emerge that could raise its profile and drive required social change within institutions, laws, and common practice that would make open science with open hardware the norm. The Gathering for Open Science Hardware (GOSH) in 2016 addressed this need. GOSH now continues as an online community with a further meeting planned in Santiago, Chile, in 2017.

(1) Public Lab; (2) Civic Laboratory for Environmental Action Research; (3) University of Cambridge

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