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## **Building Safeguards Technologies using Open Source Software and Hardware - Learning from the Maker Movement**

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Safeguards technologies are typically developed by the agency and national support programs. More and more, they rely on extensive software and information technology usage. Especially in these fields, recent years showed the advance of new approaches to foster innovation. There is increased use and development of open source software, where not only a software package is shared freely, but also the underlying source code. It is now a widespread way of developing and distributing new software. Similar to the software engineering process, hardware designs can be shared under open hardware standards. This, together with the maker movement created very efficient innovation environments for people to develop new tools and projects.

In this paper, it will be analyzed how lessons learned from these areas could be applied to the development of new safeguards technologies. Open source approaches could potentially increase the number of participants helping developing tools. At the same time, they would allow to put verification and monitoring tools under external scrutiny, thus increasing trust and transparency. Lastly, they could increase the actual user community by lowering costs and access barriers to tools, helping capacity building as well as the daily operation. The paper will introduce the open source approaches and the maker community and discuss how safeguards technologies would benefit from integrating those ideas. As an actual example, a prototype gamma spectrometry information barrier, which was build using open source software and open hardware, will be introduced. In the end, the paper will lay out ways to implement the discussed approaches.

### **Topics**

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