**Abstract**

A fundamental measure of the veracity of a scientific experiment is the extent to which the results can be reproduced. This thesis details the development of an Open Source Hardware (OSH) process and platform to address the need for documentation and validation of devices published in scientific studies.

The yearly growth rate of academic publications is measured to be 4.7%. [1] In part, this is a consequence of advancements in research hardware, which enable empirical studies through experimentation and observation. As researchers generate custom hardware designs to perform their studies, hardware documentation is poorly documented in manuscripts or otherwise. Consequently, external researchers lack the experimentation hardware and the study fails to proliferate. Hardware validation is rarely performed, and if so, verification methods are not published. Subsequently, journal reviewers have insufficient information to verify a prospective publication, leading to potentially false speculations. Although researchers routinely design custom devices integral to conduct research, the current fidelity of technical documentation is inadequate.

The Open Source Hardware (OSH) platform facilitates the sharing of verified hardware designs, allowing research facilities to broaden their experimentation capabilities. The platform is an infrastructure of research facilities, student curators, and a technical documentation framework for hardware publication, conveyed through a web platform. The platform was designed by conducting four case studies on hardware design projects in collaboration with three research facilities, developing an undergraduate workshop, and a study of custom designed devices referenced in scientific journal publications. The mission of the OSH platform is to facilitate the sharing of verified hardware designs, enabling the proliferation of scientific research.