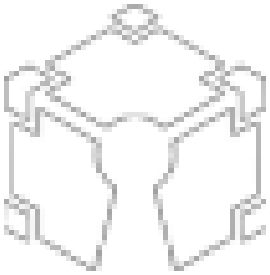

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Current and Future use of Open Source in Space Science and Data Processing

Open Source is still a relatively new term for many academics. They often do not know of open source works that are as useful as more widely used proprietary products. Reasons for this include lesser awareness of open source and its advantages, difficulty in migrating from existing proprietary systems, and sometimes, lack of documentation.

The first section of the paper will introduce the reader to low open source usage, not just in cubesat development, but in all of space science. Possible reasons for this, like an apparent inherent difficulty in its use will be discussed, thereby setting a direction to discuss possible solutions in the following sections.

The next section addresses these reasons by providing a comprehensive resource for space scientists to easily choose suitable open source works. This shall be discussed in two sub-sections: (i) Tools required in development of projects, and (ii) Tools required for data processing.
For example, the developmental phase may require software for simulations (Eg: GNU Octave, LTSpice) or hardware for testing circuits (Eg: Arduino). The data from missions needs to be acquired (Eg: GNSS-SDR), and processed (Eg: OpenCV for image processing).

The paper will then discuss open data, a term that's infrequently heard of in the context of space science. Specifically, the growing need for open data, challenges posed by international and economic policies, ways to overcome them, and how a path to this concept is already being opened up (Eg: SpaceX) will be discussed.

Finally, the paper will discuss how people in Space Science can themselves contribute easily to this indispensable and ever growing resource, and conclude with a proposed vision for a complete, Open Space Science.

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