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FROM FAB LAB TO SPACE LAB: LEVERAGING OPEN-SOURCE DIGITAL FABRICATION FOR FUTURE SPACE MISSIONS

Abstract

Future space missions require innovative and cost-effective ways to design and build technology. This paper explores how open-source digital fabrication techniques, learned through Fab Academy, can be used to develop tools, robots, and equipment for space exploration. By using 3D printing, CNC machining, and laser cutting, we demonstrate how rapid prototyping can help create space-ready technology quickly and efficiently. The study also highlights the role of electronics design and embedded systems in making these prototypes functional. This research shows how Fab Lab-inspired manufacturing methods can reduce costs, increase flexibility, and make space exploration more accessible by allowing astronauts and engineers to build and repair tools both on Earth and in space.