

## Design of Quality Assessment System for On-Orbit 3D Printing Based on 3D Reconstruction Technology

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**Abstract :** With the increasing demand for space use in multiple sectors (navigation, telecommunication, imagery, etc.), the deployment and maintenance demand of satellites are growing. Considering the high launching cost and the restrictions on weight and size of the payload when using launch vehicle, the technique of on-orbit manufacturing has obtained more attention because of its significant potential to support future space missions. 3D printing is the most promising manufacturing technology that could be applied in space. However, due to the lack of autonomous quality assessment, the operation of conventional 3D printers still relies on human presence to supervise the printing process. This paper is proposed to develop an automatic 3D reconstruction system aiming at detecting failures on the 3D printed objects through application of point cloud technology. Based on the data obtained from the point cloud, the 3D printer could locate the failure and repair the failure. The system will increase automation and provide 3D printing with more feasibilities for space use without human interference.

**Keywords :** 3D printing, quality assessment, point cloud, on-orbit manufacturing

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