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Robotic Precursors to Human Exploration (03)
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STRATEGIES FOR SAMPLING OF PLANETARY MATERIALS BASED ON IMAGES

Abstract

Identifying objects of interest for sampling to further evaluate their scientific value is crucial for understanding of planetary environments in order to effectively prepare for human exploration. Prior to a human mission, the sampling process is delayed due to limited bandwidth and human remoteness. This paper reviews image processing techniques such as Bayesian networking used to identify objects and catalogue desirable samples. It presents the current state required for sampling materials as efficiently and effectively as possible. The exploration scenario investigates the possibility of using a robotic geologist to autonomously identify desirable rocks for further examination, and choosing the few selected for additional observation by scientists manually on Earth. Emphasis is placed on autonomous classification based on the object's texture and colour on images.