Abstract #763

English

Autonomous digging: Reducing the impact of communications delay for planetary mining

In this paper we discuss the advantages of using an admittance-based digging algorithm to issue the high frequency commands required to load a bucket with fragmented rock. Currently these commands must be provided by an expert human operator, working with limited environmental feedback. These high frequency digging commands become ineffective if there is significant communication delay between the operator and the mining vehicle, as would be the case on many celestial bodies. The admittance-based digging algorithm can issue these high frequency digging commands locally, leaving the low frequency where and what to dig commands to remote human operators. The algorithm is also more efficient than human operators because it uses the digging reaction forces to modify the path of the bucket at high frequency. The autonomous digging algorithm should allow mining vehicle operators to be further removed from hazardous work sites on Earth, and could be essential for early infrastructure construction and resource stockpiling on our moon in advance of human arrival.

French

No abstract title in French

No French resume

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