

SPACE SYSTEMS SYMPOSIUM (D1)  
Enabling Technologies for Space Systems (2)

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A NOVEL APPROACH TO REGOLITH PARAMETER EXTRACTION WITH A MICRO ROVER  
SCOUT**Abstract**

This paper presents a novel artificial neural network approach for estimating regolith parameters and producing mobility metrics. We present an approach which acts as an enabling technology for all future rover missions. Regolith parameters influence the performance of all ground rovers. Martian regolith is mostly sand; local variations in composition are unknown. Current approaches to regolith parameter estimation depend on stereo vision, laser measurements and kinematic models. The Canadian analogue micro rover, Kapvik, has an instrumented chassis to provide feedback information such as wheel load, wheel slip and wheel torque. The regolith parameters are estimated online during the rover's traverse. These estimated parameters are fed into a traction control system to improve the rover performance and reduce power consumption. A rover may create a mobility map based on metrics derived from the chassis measurements.