



## **ROVER TRAVERSABILITY ASSESSMENT VIA VISUAL SENSING OF SPATIAL AND TEXTURAL TERRAIN IMAGE FEATURES**

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**ABSTRACT**—Visual sensing techniques are presented for enhancing rover traversability assessment on planetary surfaces. Geometric information from stereo image range data is used to identify salient terrain features such as rocks, and that information, along with terrain image appearances, is associated with rover traversability. Performance of rule-based, neural network, and fuzzy logic methods for classifying Mars terrain is evaluated revealing superior capabilities of the latter two. Bayesian, Parzen, and k-Nearest Neighbor decision fusion models are considered to improve classification, revealing slightly better performance of the former. Terrain classifier path planning applications are verified experimentally using a mobile robot in mock terrain.

**Key Words:** Terrain Traversability, Planetary Rovers, Visual Sensing, Neural Network, Fuzzy Logic, Decision Fusion