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Master Thesis Defense

Entitled

FEASIBILITY STUDY ON THE CHARACTERIZATION OF MARS ATMOSPHERIC AND SURFACE FEATURES IN SPACECRAFT IMAGES BY MACHINE LEARNING AND SIMILAR AUTOMATED METHODS

by

Hind Hassan Ali AlRiyami

Faculty Advisor

Abdelgadir Abuelgasim

Geography and Urban Sustain-(CHSS)

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Abstract

This thesis is focused on automated detection of Mars atmospheric and surface features in spacecraft images based on machine learning and similar automated methods using crater detection algorithm (CDA) software, named DeepMars2 algorithm. The purpose of this study is to perform machine learning to detect coarse and high craters on mars. The algorithm is applied to two digital elevation models (DEMs) of the Mars surface high and coarse resolution in order to identify different craters on using machine and deep learning methods. The DEMs are based on the satellite instruments MOLA/MGS (Mars Orbiter Laser Altimeter/Mars Global Surveyor) and HRSC/MEX (High Resolution Stereo Camera/Mars Express) and have different resolution. The crater catalogue of Robbins and Hynek provide ground–truth data for both metrics. The data showed more matches of coarse resolution topography than high resolution topography by a difference of 1,686 craters.

Keywords: ML, Craters, Mars, Deepmars2, CDA, DEM.