Label Mars.Net: Crowd-Sourcing an Extremely Large High Quality Martian Image Dataset

Overview
Label Mars (www.labelmars.net) is a tailored citizen science activity designed to collect geological annotations of Martian rover navigation camera images by directly involving the planetary science and wider geology communities. As part of ESA’s Novelty Or Anomaly Hunter (NOAH) Project it will provide a large, high quality dataset to develop state-of-the-art machine vision algorithms for autonomous science detection, targeted at future rover missions.

The Value of Annotated Datasets
Large, annotated datasets are of exceptional value to the computer vision community and the Mars exploration community. The goal of Label Mars is to achieve 5000 annotated images – this will make it one of the largest geologically annotated Martian rover imagery database for vision research and development.

The images to be labelled are sampled from the Spirit, Opportunity and Curiosity navcam sets, chosen to be representative of the likely ExoMars rover terrain. The labelled data sets will allow the comparison of different sets of images e.g. along a traverse of a single rover or between different landing sites. Questions such as frequency of float rocks, or the abundance of light-toned veins can be treated statistically over a large set of images. From this, environmental and formation parameters can thus be characterized e.g. the intensity of fracturing at different rover positions/landing sites.

Get Involved
Participants of Label Mars have the chance to influence state-of-the-art space autonomous system development and contribute their expertise to have a lasting impact on future planetary exploration.

The Label Mars project is open now for registration at www.labelmars.net

The Drive for Science Autonomy
Bandwidth or communication limitations may make real-time control of instruments for scientific discovery difficult or impossible. For planetary rovers there is a trade-off between detailed observation to ensure important targets are not missed, which requires slow traverses to downlink all the data and maintaining sufficient progress to visit many science targets. By adding an autonomous capabilities to detect scientifically interesting phenomena in images we can enhance the scientific return of robotic exploration missions.