



Abstract #823

English

ExoMars Cameras – An Input To The Rover Autonomous Mobility System

During the 2018 ExoMars mission, led by the European Space Agency (ESA), the ExoMars Rover will traverse across the Martian surface to search for past and present signs of life. Where Thales Alenia Space – Italy is the industrial prime, Airbus Defense and Space is responsible for the design and development of the Rover, which includes the autonomous mobility system. To maximize the scientific return during the mission, by pinpointing and traversing to sites of interest, the rover must be capable of advanced autonomous navigation. As such, the ExoMars Rover mobility system includes several critical subsystems to achieve a high level of precision and autonomy. One of the most critical aspects to perform the autonomous navigation is the interface between the stereo navigation and localisation cameras (the ExoMars Cameras) and the mobility algorithms. The ExoMars Camera (EXMC) is a stereo camera, with a mass less than 800 g, peak power consumption less than 2.5W, unprecedented accuracy over a wide temperature range, automatic distortion correction, and the ability to survive harsh Martian environment without heaters. The EXMC provides an efficient and accurate means of collecting and reporting high-quality, calibrated images to the mobility algorithms for processing. Two units of the EXMC are used within the ExoMars Rover, one mounted atop the RV mast used for navigation and another mounted on top of the Rover body used for localisation. The details of the EXMC and the high level description of the mobility algorithms are discussed herein, with an emphasis on integration of the two subsystems to permit advanced navigation and localisation capabilities of the ExoMars Rover. The benefits of this low-power and low-mass solution to rover navigation will be shown, with indications of its applicability to other industries.

French

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