Fusion and Interactive Rendering of 3D Vision Products in Various Scales for the Characterization of Planetary Surfaces

G. Paar (1), C. Traxler (2), B. Hesina (2), K. Sander (1), B. Huber (1), A. Bauer (1), B. Nauschnegg (1), J. Steiner (1)

(1) JOANNEUM RESEARCH, Graz, Austria; (2) VRVis, Vienna, Austria

Imaging of planetary surfaces has been performed for more than 4 decades, both from orbit and by camera devices mounted on planetary probes such as rovers and landers. The set of images collected so far starts on full-planet level and continues with image data collected during descent and landing. Rover and lander imagery contains further scales from panoramic stereo sequences taken from adjacent sites down to hand-lens and even microscopy level. The FP7-SPACE project PRoViDE tries to perform a fusion of 3D and 2D imaging products in different levels of detail, exploiting these various available image data scales. The fusion result is fed into a real-time rendering tool that allows seamless interactive virtual navigation and measurements, starting with planetary level down to the highest resolution available from the close-range instruments.

The presentation will point out the major steps of current and future PRoViDE development, driven by objective stated by the Planetary scientist. The current version of the real-time rendering tool will be demonstrated using a current set of representative multi-scale data. We will jointly discuss the benefit of such a tool for landing site selection & characterization, and address the technical challenges of data fusion and representation. The discussion should lead to a common understanding of requirements to the fusion and visualization aspects to be covered throughout the remaining PRoViDE period until end of 2015, also in strong synergy with the forthcoming ExoMars 2018 Rover mission.