PRoViScout - Planetary Robotics Vision Scout
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D4.1.1 ProViScout Sensors

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Lead contractor for this deliverable CSEM
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EXECUTIVE SUMMARY

The research project PRoViScout (Planetary Robotics Vision Scout) establishes an architecture for future autonomous planetary missions of earth like terrains: Envisioned platforms are rovers and aerial vehicles. On these platforms, sensors are attached. The visual data captured by a variety of vision sensors are turned into data products that allow autonomous decisions about navigation and scientific target selection in a core processing module. Thus, the required extent of data transferred and the inevitable time delay via a continuous remote control, are reduced dramatically.

In PRoViScout, the robotic vision is based mainly on four sensors:

- the CSEM time-of-flight (TOF) camera capturing three-dimensional data by demodulating the phase information of the built in, modulated high-power laser illumination. The camera is equipped with a zoom lens, so that the field of view can be changed between approximately 30° and 5°. An RGB camera is sharing the same lens, two dimensional of high resolution and three dimensional data are captured simultaneously.
- the Aberystwyth University PanCam Emulator (AUPE), which is an emulator of the planned ExoMars PanCam. It consists of a pair of multispectral high resolution cameras delivering stereoscopic images accompagnied by a high-resolution camera;
- the MSSL hyperspectral camera (HyperCam) with continuously tunable filter; by setting different filter arrangements various camera types can be investigated on the platform
- the MSSL a wide-angle laser imager (WALI) with an active ultraviolet illumination to cause fluorescence in the region of interest. Context images are captured of the target area in white light and then images are captured of fluorescence light excited by the UV LED, for example in biological pigments of interest.

This document summarizes the current status of the sensor development with an emphasis on the TOF and the AUPE instruments. The final document for the HyperCam and WALI has been delivered in May 2012.

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