



## **PRoViScout - Planetary Robotics Vision Scout**

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### **D5.2.1 PROVIM visualization interface**

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**Work package 5 – PROVIM**

**Lead contractor for this deliverable** TRS

Dissemination level: Confidential, only for members of the consortium (including the Commission Services)

#### **EXECUTIVE SUMMARY**

The PRoViScout research project aims to develop a frame work for autonomous sample identification and sample selection through planetary robotic vision processing by bringing together the European space community and supported by NASA-JPL. Through the on-board autonomous processing of visual data products, science prioritisation and platform control of robotic missions, reductions in the operational cost and increases in return data can be realised. Through PRoViScout a unified and generic approach for future robotic missions in robot vision, on-board processing, and navigation and scientific goal detection will be developed. The project also aims to provide an increase in the public awareness and generate procedures for distributing mission data and information to the scientific community and general public. The culmination of the project will lead to the integration of all the individual components into a single operational system which will be demonstrated at several field demonstrations. During the preparation of the operations, it is of capital importance to be able to visualize the rover inside the environment in which it operates, to place the targets and the waypoints that the rover should follow and to rehearse the motions in order to check their feasibility. In addition, during real operations there is a need to monitor in 3D the operations to better understand and analyze the system behavior. These are the main objectives of the 3D Robotic Visualisation and Rendering (3D-RV) tool.

To this end, the 3D Robotic Visualisation and Rendering function mainly includes:

- a) The 3D Scene Rendering module that renders in a photo-realistic virtual scene the real or the simulated rover and its surrounding environment.
- b) The Rover S/S's Movement Control that supports the specification of 'targets' to be reached be the rover mechanisms
- c) The Data Monitoring that allows animating the robotic system in the synthetic scene, displaying on-line in 3D and analysing downloaded or simulated data.

The 3D, kinematic and dynamic models of the robotic system Main underlying packages are the Ogre3D rendering engine and the Nvidia PhysX dynamics engine. This report presents all the development process of the 3D Visualization and Rendering software from the requirements to the design, and presents test results.

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