

PRoVisG - Planetary Robotics Vision Ground Processing

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EXECUTIVE SUMMARY

The PRoVisG research project aims to develop a framework for planetary robotic vision processing bringing together the European space community. Through the better processing and visualisation of data products from robotic missions, reductions in the operational cost and increases in data output can be realised. The project also aims to increase public awareness and provide procedures to effectively distribute mission data and information to the scientific community and general public.

This document gives an overview of further use of PRoVisG results by identify opportunities and evaluate use cases in space and terrestrial sciences plus commercial or public applications, on top of the “regularly planned” results PRoVisG is providing (software & dissemination). One typical example is to use a rover with vision capabilities for these applications. Such applications are e.g. rover actions in contaminated areas, arctic expeditions or underwater explorations. For each opportunity and use case several aspects (unless confidential) are given such as:

- ❖ Project / Product environment
- ❖ Status (We distinguish between potential possibilities and explicit activities that lead to the initialization of such possibilities)
- ❖ Components & aspects developed within PRoVisG used
- ❖ Potential partners
- ❖ Added value
- ❖ Prospects & Impact
 - Commercial
 - Strategic
 - Educational
 - Societal & Dissemination
 - Scientific
 - Technical
- ❖ Planned future agenda for further exploitation
- ❖ Cooperation between PRoVisG partners stemming from PRoVisG collaboration
- ❖ A-posteriori spin-in into PRoVisG (i.e. what could have been improved during PRoVisG Lifetime)

This document gives an overview of further use of PRoVisG achievements. It comprises spin-off activities from a wide field of past, actual, and upcoming missions (see section 4.), which are ideal application cases of PRoVisG results. These results are for instance PRoViP, PRoGIS, and the Stereo WS toolbox. Aside, diverse spin-off activities / ideas are presented directly exploiting PRoVisG internal developments (section 5.). Furthermore, space-related and industrial spin-off applications were given (see section 6. and 8.) as well as a series of related follow-on field activities (in section 7.) plus examples of ongoing research in vision and space (section 9.) which immediately benefits from all the field activities by gathering data and experiences. On top of the “regularly planned” outcome PRoVisG is providing software and dissemination.

PRoViP, including selected major software components provided by the partners, is the core for the processing of rover imagery and serve as basis for the use in future missions. Two important follow on projects PRoViScout (4.2.3) and PRoViDE (if selected, see 4.3.1) will, on the one hand, directly exploit PRoViP as Europe’s approach of a united planetary image data processing chain. On the other hand, the spin-off projects will enable to further improve PRoViP in terms of the functional pool as well as interoperability.

One of the main P_{RO}VisG developments is a web based GIS that involves a comprehensive vision data processing chain as well as visualization of the context, history, vision metadata, and derived products for complete robotic planetary missions (5.3). Further development is required to bring the full complement of features to a realisation for P_{RO}GIS and to meet the high demands for space robotic missions.

All in all various platforms were exploited (EU/ESA/national) and the P_{RO}VisG activities and effects exceeded the expectations from proposal.

Table of Contents

1. Issue Record.....	2
2. Executive Summary	3
2.1 Accronyms	4
2.2 List of Spin-Off Items.....	6
3. Contents	7
4. Past, Current, And Planned/Upcoming Missions/Projects.....	9
4.1 Past Missions.....	9
4.1.1 Soviet Luna Programme (Lunokhod-1/-2).....	10
4.1.2 US Apollo Programme	13
4.2 Current Missions/Projects	14
4.2.1 Mars Exploration Rover (MER).....	14
4.2.2 Exploration of Mars (ExoMars)	14
4.2.3 P _{RO} ViScout	14
4.2.4 Mars Science Laboratory (MSL).....	15
4.3 Planned/Upcoming Missions/Projects	16
4.3.1 P _{RO} ViDE.....	16
4.3.2 LUNA-GLOB and LUNA-RESOURCE	17
4.3.3 Mars Sample Return	17
5. Exploitation of P _{RO} VisG Internal Developments	18
5.1 Provip As A Whole	18
5.1.1 Concrete Activities	18
5.1.2 Options / Possibilities	18
5.2 Provip Components.....	19
5.3 P _{RO} GIS.....	19
5.3.1 MSL Visualization	19
5.3.2 MER Data Archive (Mirror) at Ucl-Mssl.....	19
5.4 Stereo Work Station As An Installable Toolbox	20
5.4.1 Software Toolbox for Stereo WS by MSSL.....	20
5.5 Spin-In of an Omni-vision Stereo Camera System.....	20
5.5.1 Study of Exploitation Modes And Added Value of Such a Device	21
5.5.2 Tenerife field campaign.....	22
5.5.3 Omni-view Optics Spin-Off	22
5.6 Spin-In of a 3D-Time of Flight Camera	23
5.6.1 Advantages of a 3D-TOF Camera	23
5.6.2 Disadvantages of a 3D-TOF Camera	23
5.6.3 Tenerife field campaign.....	24
5.6.4 3D-TOF Spin-Off.....	24
6. Space-related development.....	25
6.1 EC-FP7 FASTER (Forward Acquisition of Soil Terrain using Exploration Rovers)	25
6.2 Study of a Sample Fetching Rover.....	25
6.3 Multi-Purpose Vision-Based Navigation System Engineering Model (VisNav)	26
6.4 Orbiter Datasets of All Nasa Landing Sites at Ucl-Mssl	26
7. Field Trials	28
7.1 ExoMars PanCam activities at CNES, Autumn 2011	28
7.2 Dachstein 2012: PanCam & WISDOM integration.....	28
7.3 Surveying Flight of Tenerife Field Trial Terrain Summer 2012	29
7.4 P _{RO} ViScout Field Trials September 2012	30
7.5 ESA SAFER 2013.....	31
8. Industrial Environment.....	32
8.2 Merging PanCam With LiDAR	32
8.3 Stereo Reconstruction For Tunnel Survey.....	32
8.4 Underwater Stereo Reconstruction.....	33
8.5 Cloud 3D reconstruction.....	33
8.6 De-Montes	34
9. Ongoing Research In Vision & Space.....	34
9.1 Vision Processing Quality Assessment.....	34
9.2 Specific Vision Space Applications.....	34
9.2.1 "Lipstick/Bullet/Sports" HDTV Video and 5 Megapixel Still Camera Pair	34
9.2.2 Fusion of PanCam with Hyperspectral Camera	35
9.3 Autonomous Navigation & Localization	35
9.3.1 Visual Odometry	35
9.3.2 Integrated Rover Localization.....	35

9.4	Mapping	36
9.4.1	Wide Baseline Mapping.....	36
9.4.2	Traverse Mapping (External/Global Rover Localization).....	37
10.	Effect of Public Outreach/ Official Web Page.....	38
11.	New Cooperations Stemming from PRoVisG.....	39
12.	Summary and Conclusions.....	40
12.1	Summary	40
12.2	Conclusions	40
13.	References	43
14.	Appendix: Video Footage Options	45
15.	Appendix: Orbital Data Report.....	51

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