



H2020-INFRAIA-2019-1

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## Deliverable D10.4

<b>Deliverable Title:</b>	Demonstrator and documentation of data-processing techniques
Due date of deliverable:	31/07/2023
Nature <sup>1</sup> :	R
Dissemination level <sup>2</sup> :	PU
Work package:	10
Lead beneficiary:	INAF
Contributing beneficiaries:	KNOW
Document status:	Final

Start date of project:	01 February 2020
Project Duration:	54 months
Co-ordinator:	Prof Nigel Mason, University of Kent

1. Nature: D

2. Dissemination level:

PU	PP	RE	CO
Public	Restricted to other programme participants (including the Commission Service)	Restricted to a group specified by the consortium (including the Commission Services)	Confidential, only for members of the consortium (excluding the Commission Services)

### Executive Summary / Abstract:

The following list of all repositories, including the dataset and data-processing techniques for the scientific cases has been released.

#### 1. Overview of Science Cases and Demonstrators

Number	Science Case	Overview/Description
1.	Mercury Surface Classification	<ul style="list-style-type: none"> <li>ML technique: unsupervised classification of spectral data, compare with chemical composition and surface ages from crater counting</li> <li>Link Repo: <a href="https://github.com/e pn-ml/MESSENGER-Mercury-Surface-Classification-Unsupervised_DLR">https://github.com/e pn-ml/MESSENGER-Mercury-Surface-Classification-Unsupervised_DLR</a></li> </ul>
2.	GMAP Deep Landforms	<ul style="list-style-type: none"> <li>ML technique: supervised, collection of deep learning-based computer vision techniques</li> <li>Link Repo: <a href="https://github.com/e pn-ml/DeepLandforms">https://github.com/e pn-ml/DeepLandforms</a></li> </ul>
3.	PITS	<ul style="list-style-type: none"> <li>ML techniques: unsupervised k-means clustering, silhouette analysis</li> <li>Link Repo: <a href="https://github.com/dlecorre387/Pit-Topography-from-Shadows">https://github.com/dlecorre387/Pit-Topography-from-Shadows</a></li> </ul>
4.	GMAP mound detection	<ul style="list-style-type: none"> <li>ML techniques: supervised, segmentation, FPN, Unet</li> <li>Link Repo: <a href="https://github.com/e pn-ml/GMAP-mound-classification-">https://github.com/e pn-ml/GMAP-mound-classification-</a></li> </ul>
5.	Mars Dust Storm segmentation	<ul style="list-style-type: none"> <li>ML techniques: supervised, segmentation, FPN, Unet, LinkNet</li> <li>Link Repo: <a href="https://github.com/e pn-ml/Mars-Dust-Storm-Segmentation">https://github.com/e pn-ml/Mars-Dust-Storm-Segmentation</a></li> </ul>
6.	Meteor Trajectories	<ul style="list-style-type: none"> <li>ML techniques: unsupervised, supervised, in progress</li> <li>Link Repo: <a href="https://github.com/e pn-ml/Meteor-Trajectories">https://github.com/e pn-ml/Meteor-Trajectories</a></li> </ul>
11.	INAF Spectral use case	<ul style="list-style-type: none"> <li>ML techniques: unsupervised (clustering), supervised (classification/regression)</li> <li>Link Repo: in production</li> </ul>