Ref. Ares(2022)7550670 - 31/10/2022

Improved Robotic Platform to perform Maintenance and Upgrading Roadworks: The HERON Approach

Grant Agreement Number: 955356

D3.2: Software for refinement of segmentation results

Work package	WP3: AI-based algorithms and tools Recognition, Classification and Localisation of the Points of Interest
Activity	Task 3.2: Precise Segmentation Refinement using Geometric Criteria and Texture Information
Deliverable	D3.2: Software for refinement of segmentation results
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Status	Final (F)
Version	1.0
Dissemination Level	Confidential (CO)
Document date	31/10/2022
Delivery due date	31/10/2022
Actual delivery date	31/10/2022
Internal Reviewers	Alexios Pagkozidis (STWS), Dimitrios Bilionis (RISA)
	This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement no 955356.

Executive Summary

This deliverable has been written in the framework of WP3 – AI-based algorithms and tools Recognition, Classification and Localization of the Points of Interest of the HERON project under Grant Agreement No. 955356. Deliverable 3.2, namely "Software for refinement of segmentation results" provides a detailed description of the followed processes in order to improve the segmentation of the points of interest (e.g. cracks, potholes). This report also illustrates the outcomes of Task 3.2, corresponding to M12-M17 of the HERON project's period.

To this end, the document presents the training, data processing, application, and evaluation of advanced deep learning algorithms such as Attention networks (e.g., U-Net, Segformer models) for image semantic segmentation and modeling towards improved and precise localization and segmentation of the PoIs. In particular, specific computer vision toolkits have been improved for feature representation of the HERON maintenance and upgrading tasks, such as patching potholes and sealing cracks. The methodology framework will address all identified categories of RI degradation so that HERON's AI system is able to effectively initiate and guide, coordinate, and evaluate the various road maintenance procedures.