DELIVERABLE 5.2

Open Data and AI algorithms

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Project Name: **Disaster Management Artificial Intelligence Knowledge Network**

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Contents

1. INTRODUCTION

The ARTION project grants open access to all the data that is collected during the field exercises conducted within the framework of the project. This data is useful for the research community, specifically in the process of developing new algorithms for emergency response. As the data is captured from realistic field-exercise scenarios, these datasets are ideal for the initial testing of newly developed algorithms before testing or using them in the field. Especially for the case of AI algorithms, the training of the algorithm is also an essential stage in the development, therefore the data may be used as well for this phase. Most of the data that is captured and released through the ARTION project constitute drones's footage, i.e., aerial videos that record the emergency response operations of first responders in the field. These videos are particularly useful in the process of developing computer-vision algorithms, which take videos and photographs from the scene as input. In fact, the AI algorithms that were developed in ARTION were computer-vision tools that operate on aerial videos and photos. Besides the material captured by means of drones, first responders' traces while operating in the field are also collected by means of a mobile application running on their smart phones. Traces of first responders from two field exercises are also provided in open-access mode.

Open access is also granted for the AI algorithms that were developed. So far, three computer vision-based algorithms are provided in open access by the ARTION project. These algorithms were tested using the drone's footage that was captured during the field exercises of the project (they were also tested using similar datasets captured during past operations, as well as other using datasets available online). The availability of these algorithms in open access is particularly useful for the scientific community. Nevertheless, the algorithms are extensively tested and ready to be used in the field. Therefore, they can be downloaded and used by first responders provided that the organization possesses personnel with some level of technical expertise in order to integrate them in their operations.

2. OPEN ACCESS OF DATA AND ALGORITHMS

2.1. Findability and Accessibility

The data and the algorithms are hosted at the Zenodo repository and are findable through ***Zenodo*** and through the ***"Disaster Management AI Portal"*** that is created for the project.

The "Disaster Management AI Portal"[1] is a website that currently gathers all the open access items – of all types – that are generated by the ARTION project. This website is hosted under the domain of KIOS UCY and, therefore, will remain available and accessible after the end of the project without any time limitation. This decision has been actually made for guaranteeing the long-term availability of the domain (without the need of payments after the end of the project). In fact, after the end of the project we plan to continue updating this site with new algorithms and datasets generated from other projects or activities of any of the consortium members.

[1] https://www2.kios.ucy.ac.cy/ARTION/disaster-management-ai-portal/

All materials, however, are hosted at the Zenodo repository (and can be accessed either directly through Zenodo or through the "Disaster Management AI Portal"). The "Disaster Management AI" community is created in Zenodo[2] and hosts all the open access items of the ARTION project. This decision has been made in order to exploit the publicity of Zenodo, which is a well-known and widely used repository, as well as to make the data easily findable. To this end, through Zenodo we aim to reach a greater audience, as we expect that many researchers may come across this material in Zenodo.

2.2. Usability

The datasets are accompanied with the necessary information in order for the potential user to be able to interpret them. We need to note that, in general, the aerial videos do not require extensive metadata to be interpreted (compared to other types of data). The format of the provided videos is MP4, which is currently the most standard and widely used video format. Also, the first responders' traces are provided at a CSV format which is a standard, widely-used format. A text file is provided to explain the fields that appear in the CSV files.

As for the algorithms, the code is written in Python programming language. Python is currently the most widely used, multi-purpose, high-level programming language. It is popular among developers with different scientific backgrounds and levels of expertise and it is a free, open-source language. Moreover, all the necessary steps in order to execute the algorithms, upon downloading them, are provided along with the code.

2.3. Licensing

In order to offer potential users the maximum capabilities with the provided datasets and algorithms, we published the material under a "Creative Commons Attribution 4.0 International" License. Under this license, it is possible to copy and redistribute the material in any medium or format, and adapt for any purpose (even commercially). The only requirement is that the user must give appropriate credit and indicate if changes were made.

[2] https://zenodo.org/communities/disastermanagementai/?page=1&size=20