Service ID S00183

Location Italy, Remote

Collection of test data during digital testing

Provider service

Politecnico di Milano (POLIMI)

Link to content

https://www.agrifoodtef.eu/services/collection-test-data-during-digital-testing

Type of Sector

Arable farming, Food processing, Greenhouse, Horticulture, Livestock farming, Tree Crops, Viticulture

Accepted type of products

Design / Documentation, Software or AI model

Type of service

Collection of test data

Description

One of the key activities during digital testing is the collection of data concerning the progression and the final outcome of the tests. Such data enable the evaluation of system performance by the customer or – if needed – by AgrifoodTEF (via Service S00184). This service manages the collection of data relevant to performance evaluation produced during the tests by both the system under test and the computational environment where the tests take place. Examples of collected data comprise information produced within a virtual environment to simulate sensor data collection in a physical environment; statistics about AI model performance in the test and deployment phase (e.g., occupied memory, number of trainable parameters, training/optimisation loss, etc.); specific labels and annotations to use as ground truth for evaluating the system; and system output when subjected to a range of test conditions. The minimum set of data to be collected is defined by the evaluation metrics that the user chose (either on their own or with AgrifoodTEF support, via Service S00178) to process them; generally, a larger set of data wrt the minimum is selected by AgrifoodTEF together with the customer to provide a richer view of the system’s performance and to enable the application of other metrics in the future, if needed. As an output of the service, in addition to the raw data, we also provide the customer with documentation describing logged features and conditions of the testing environment at the time of testing, as well as any parameter values, variation ranges and specifics required for reproducibility purposes.

How can the service help you

When executing digital tests leveraging computational resources provided by AgrifoodTEF, the collection of meaningful data requires in-depth knowledge about the type of infrastructure used for the tests and about the specifics of AgrifoodTEF's implementation. This service helps customers obtain the required data without having to build the internal competencies needed to perform data collection on their own. By leveraging this service, the customer relays the task of collecting data to AgrifoodTEF's team of engineers, who are experts in both data collection campaigns and in the architecture and tools of AgrifoodTEF's digital infrastructure.

This service allows the customer to leverage the capability (that only digital testing has) of allowing perfect reproducibility/repeatability of tests: perfect control over the test environment is in fact available, so the problem of reproducibility/repeatability is reduced to possessing full information about the environment and the tests performed in it.

How the service will be delivered

This service description is intentionally generic. Every instance of this service is, in fact, customised to adapt it to the needs and requirements of the specific customer. The following is an example of a service instance.Example service: To avoid damaging plants during robotic weeding operations, the customer wants to test an intra-row navigation solution in simulation before deploying the system in the field, so a suitable simulation (based on Gazebo) of the robot and environment has been prepared. To help the customer thoroughly validate their navigation software, we run the simulation and collect point cloud data within a Gazebo simulator. The collected data represent plant rows of different lengths (3, 5, and up to 10 metres), intra-row widths (from 3 down to 1 metre), and plant densities to enable system testing under scenarios of varying difficulty.

During these activities, we collect datasets describing the interaction of the robot with the simulated environment; additionally, we collect the full (simulated) sensor data streams so that the customer can use them later (e.g., for training of AI models). We also provide the customer with a report describing the different data fields included and their frequency of collection, as well as the full configuration files of the simulation environment, thus making it possible to exactly reproduce the tests in the future.

Service customisation

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