Service ID S00291

Location Italy, Remote

AI model training

Provider service

Politecnico di Milano

Link to content

https://agrifoodtef.eu/services/ai-model-training

Type of Sector

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

Accepted type of products

Data, Software or AI model, Other

Type of service

AI model training

Description

This service concerns training AI models on behalf of the customer for a specific task and optimisation objective, e.g., improving accuracy on crop classification from image data. The target model is the solution provided by the customer that needs to be enhanced with respect to a set of pre-determined features to reach the desired performance level. However, if required, the training can also be applied to additional state-of-the-art models available in the market for benchmarking purposes. If not defined by the customer, some features of the training process can be identified via service S00179 (desk assessment activities for digital systems and/or data): for instance, model features to improve, reference model baselines to include in the performance comparison, as well as benchmark datasets. The data used for training the model can be either provided by the customer or annotated ad hoc as a preparatory activity to model training (via service S00290 - Data Labelling); another possibility is that data are retrieved among reference benchmark datasets that are openly available. We will also agree with customers on the level of hardware acceleration required, based on the considered AI models: e.g., GPU acceleration via connection to a remote server vs. on-device training.

How can the service help you

Training an AI model is an activity that requires specialised expertise and working knowledge of the tools to be employed. As such, it is often outside the know-how of the technical personnel of companies developing systems for agri-food applications.

This service provides the customer with access to a team of engineers expert in setting up and executing AI model training operations, as well as to a computational infrastructure that can support the training and ensure it gets completed within a short timeframe.

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: The customer is interested in promptly identifying the emergence of the Peronospora (downy mildew) disease in vineyards. Peronospora symptoms can be detected by inspecting changes on the leaf surface (appearance of small spots, gradual changes in the leaf colour).

The customer has already implemented a computer vision model to classify leaves as healthy or unhealthy. However, the model needs to be re-trained to account for the collection of higher-quality images and annotations of disease symptoms (e.g., via S00113 - Collection of test data during physical testing and via S00290 - Data labelling). Since the solution is expected to work in real-time, we use a TPU-accelerated stick readily available on the market to train the model directly on

Service customisation

The duration of this service depends on the features of the training to be executed and the data to be employed as input. As a guideline, in typical cases the service may require 3-4 weeks.

The first phase of the service involves one or more interviews where the customer defines, together with AgrifoodTEF, the goals and tools of the training. If the model to be trained is provided by the customer, it is done during this phase, under NDA if needed. The customer is also asked to provide AgrifoodTEF with the data to be used for training, except when publicly available datasets are chosen; another possibility is to use datasets available to AgrifoodTEF.

The second phase of the service involves the setup and execution of the training, performed by AgrifoodTEF. The training procedure will be monitored by tracking the evaluation metrics that are relevant to the end task (e.g., training loss wrt the optimisation objective, average classification precision and accuracy, ...).The outcome of the service is the trained model, provided in the format preferred by the customer.