

**Service ID** S00298

**Location** Remote



## Testing and validating AI models in a simulated environment

### Provider service

Instituut voor Landbouw-, Visserij- en Voedingsonderzoek (ILVO)

### Link to content

<https://agrifoodtef.eu/catalogue-of-services/testing-and-validating-ai-models-simulated-environment>

### Type of Sector

Arable farming, Greenhouse, Horticulture, Livestock farming

### Accepted type of products

Software or AI model

### Type of service

AI model training, Collection of test data, Performance evaluation, Test execution

### Description

This service enables the thorough testing and validation of your AI models within a simulation environment, ensuring optimal performance before real-world deployment. We implement your AI model and its corresponding dataset into advanced simulation software, allowing it to be tested without hardware limitations or with hardware-in-the-loop simulations where AI is (partly) integrated into the hardware or operating software. For example, the AI could simulate a robotic system navigating a field to detect and remove weeds. This method ensures your model functions accurately and efficiently under various conditions, accelerating its readiness for practical use in agri-food applications like precision farming or automated harvesting.

## How can the service help you

- > Gain valuable insight into the performance of your AI-solution in real-world applications without hardware limitations
- > Test the integration of your AI-solution into your hardware-solution in a controlled environment

## How the service will be delivered

You can select the type of simulation environment, such as agricultural fields, barns, or greenhouses, and the conditions under which your AI will be tested, whether it's hardware-in-the-loop or purely virtual simulations. The service allows for flexibility in scenarios—ranging from weed detection and removal to autonomous navigation—and can be tailored to include different variables such as weather, terrain, or crop types. You also have the option to integrate custom datasets or sensors to replicate real-world conditions as closely as possible, ensuring that your AI is tested in scenarios that align with your operational goals.

## Service customisation

The appropriate simulation environment is set up, and your AI model and necessary datasets are integrated into the system. If no datasets for your solution are available yet, they can be provided through other services. Simulations can be run without hardware constraints or with hardware-in-the-loop for more realistic testing. For example, we can simulate a robot moving through a field where your AI model must detect and react to weeds or obstacles. After the simulations, we provide detailed performance reports, including accuracy, efficiency, and potential areas for improvement.