ARPA 4 - Qualification of safety systems for human detection and collisi

Provider service

INRAE

Link to content

https://agrifoodtef.eu/services/arpa-4-qualification-safety-systems-human-detection-and-collision-avoidance-diverse

Type of Sector

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

Accepted type of products

Design / Documentation, Physical system, Other

Type of service

Collection of test data, Performance evaluation, Provision of datasets, Test design, Test execution, Test setup

Description

The ARPA 4 test thoroughly evaluates the safety systems of agricultural robots, focusing on their ability to detect human-like obstacles and automatically stop to prevent accidents. It simulates real-world scenarios by positioning mannequins in front of the robot as it moves through artificial crop rows. Using a high-precision laser tracking system, the test measures the robot's trajectory and speed at our Montoldre site in France. This ensures the robot can safely operate in environments like vineyards or orchards, providing valuable insights into its emergency stop functions and compliance with safety standards. A manufacturer's representative must oversee the process.

How can the service help you

This service is designed for manufacturers of agricultural robots and safety systems. It evaluates how well these robots can detect and respond to human-like obstacles safely and efficiently. Prior to testing, there may be concerns about the robot's ability to handle critical safety situations in real-world environments such as vineyards or fields. Once the test is completed, the robot's safety system performance is verified, demonstrating its capacity to detect obstacles and halt in time efficiently.

How the service will be delivered

ARPA 4 uses a laser-based tracking system to precisely measure the robot's movements. The test involves running several tests with mannequins placed in the robot's path to simulate real-world risks.

Service customisation

The ARPA4 test can be customised to focus on specific safety features manufacturers wish to evaluate. These features are jointly established before testing. However, the tests mainly determine the robot's ability to detect and stop when encountering human-shaped obstacles in its working area.