AI and Robotics in Agriculture – How to Enable Real-World Applications?

Riccardo Bertoglio*[1]

[1]TSCF – INRAE – France

Résumé

Artificial Intelligence (AI) and robotics have become increasingly pervasive across many sectors, including agriculture. Agricultural robotics holds the potential to address pressing global challenges, particularly those linked to the transition toward more sustainable and environmentally friendly farming practices.

Robots can be employed to perform tasks such as the mechanical removal of weeds, reducing or even eliminating the need for chemical herbicides. This is essential to support the increased frequency of interventions required for mechanical weeding compared to conventional chemical treatments.

To operate effectively in the field, agricultural robots must be equipped not only with actuators to perform physical tasks, but also with advanced perception algorithms to interpret their surroundings-whether it's detecting weeds in soil or identifying fruits on trees.

Despite the remarkable progress of AI in interpreting complex data, a key question remains: are these systems truly capable of handling the high variability and unpredictability of real-world agricultural environments? And to what extent can they generalize across different conditions, crops, and locations?

*Intervenant