Project title
Robotics and Artificial Intelligence in Agricolture

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Description
Goals:
Artificial intelligence
- Using data acquired from multispectral cameras and other sensors to monitor plant status, e.g., growth, well-being, presence of pests, through pre-trained neural networks that will be optimized by fine-tuning on specific crops.
- Optimization of deep learning algorithms for plant and fruit recognition.

Robotics
- Optimization of a rover available at UNIVR to perform tasks on crop(s) that will be chosen during the research period
- Integration of the sensing module within the autonomous driving layer in order to move the agricultural rover inside greenhouses or in open fields.
- Controlling robotic arm(s) mounted on the agricultural rover to perform the necessary tasks on the crops.

The research activity will make it possible to increase efficiency in harvesting and monitoring the fields, and will allow the introduction of digitization within the agricultural world.

The training activity will focus on the following topics: (1) design/optimize multi-spectral sensors for precision agriculture; (2) develop algorithms for mobile robotics; (4) develop artificial intelligence algorithms for data analytics.
The PhD student will attend the courses offered by the doctoral school to acquire the credits necessary for the achievement of the degree. The period abroad at TSCF, INRAE Clermont-Ferrand will allow the student to acquire further skills.

The PhD student will contact agricultural associations and machine manufacturers to value his/her work and to learn from them specifications, requirements and needs. Dissemination of the scientific results is expected by attending scientific conferences and sector fairs.

Abroad period
The PhD should spend his/her abroad period at

TSCF, INRAE Clermont-Ferrand
9 avenue Blaise Pascal, 63170 Aubière, France

TSCF: Technologies et systèmes d'information pour les agrosystèmes
INRAE: French National Research Institute for Agriculture, Food and Environment