Organized Session 10

Robotics and Sensing Technology for Smart Vineyards and Orchards

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Concept of Organized Session

Research on smart agriculture, such as robotization and sensing technology, has been conducted mainly in paddy and crop fields. On the other hand, smart agriculture has not progressed in vineyards and orchards because fruit products in vineyards and orchards were not the principal food, therefore less research has not been conducted on these fields.　However, fruit products have become more popular, as the demands for fresh fruits and wine are increasing year by year. Most vineyards and orchards are located in mountainous regions with harsh conditions and few residents, and thus the labor shortage is a significant problem. Smart vineyards and orchards require robotics and sensing technologies that differ from those used in paddy and crop fields due to the trees and the different tasks involved.

In recent years, a lot of new devices such as high-quality cameras, hyperspectral cameras, depth cameras, and 3D-LiDARs have been widespread and are expected to help improve robotics and sensing technologies. Similarly, new estimation and analysis methods such as machine learning and deep learning are available and are also expected to be applied in the agricultural field. This session focuses on robotics and sensing technologies using the latest sensors and methods for vineyards and orchards.

**Keywords:** Autonomous driving, fruits quality detection, harvesting robots, fruits detection.