A prototype of an autonomous ground robotic platform for precision orchard management

Dario Mengoli[1], Lorenzo Marconi[1]

[1]Department of Electrical, Electronic, and Information Engineering "Guglielmo Marconi", Alma Mater Studiorum - Università di Bologna, Bologna, Italy

The current world situation is more and more facing one of the biggest challenges in food production. It is estimated that over 70% of global freshwater withdrawals and half of the world's habitable land is used for agriculture. Considering that the overall world population is growing, it is clear that an optimization in the food production chain is needed to ensure the survival of the human kind. One of the key factors in this optimization process is to incorporate cross-industry technologies and applications such as robots. In this context, the replacement of traditional tractors with more technology advanced robotic platforms is a key aspect to ensure sustainability both in term of cost effectiveness and environment preservation. In this talk, we present the outcome of our research project that aims to completely automate the management of an orchard. As arable crops already have managed to reach a high level of mechanization, we found that the work of fruit growers can benefit of an implementation of technology to achieve the same level of automation. As the autonomous navigation within the orchard and obstacle avoidance maneuvers are some of the goals that are already achieved, the specific orchard environment presents new challenges such as fruit picking or pruning that we aim to solve within our research project.