EXPECTED IMPACT

Economical and Social Impacts

- Significantly reduce the negative environmental impact of farming due to over-application of chemicals. Biological control instead of chemical pesticides
- Improving vineyard health monitoring at plant level
- Creating a new robotics products for agriculture and new jobs
- Increasing market adoption of agricultural robots

Scientific and Technical Impacts

- Long-life operations in large harsh environments
- Navigation on sloped rough terrains
- Improved classification algorithms for grapevine parts

GRAPE

Ground Robot for vineyArd monitoring and ProtEction

More information on
www.grape-project.eu

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ECHORD++

The European Coordination Hub for Open Robotics Development

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Consortium:

eurecat Centre Tecnològic de Catalunya

VITIROVER MICRO ROBOTIQUE VITICOLE

POLITECNICO MILANO 1863

THE PROJECT

GRAPE aims at contributing to the technical advancement of precision agriculture, in particular, to the market of instruments for biological control by developing the tools required to execute vineyard monitoring and farming tasks with (semi) autonomous Unmanned Ground Vehicles (UGVs).

1

Development of a robotic platform for vineyard applications enabled for:
- Navigation on rough and sloped terrains
- Plant detection and health monitoring
- Small objects perception and manipulation

2

Increasing robot acceptance by farmers and agronomists by:
- Developing a friendly user interface for operations
- Increasing decisional autonomy of the robot
- Engaging winegrowers and stakeholders in the developing process

TECHNICAL OBJECTIVES

1

Advanced capabilities for vineyard navigation
- 6DoF localization and 3D mapping
- Path planning considering terrain characteristics and kinodynamic constraints

2

Enhanced perception for plant health monitoring
- Detection of plants in highly unstructured environment and geometric reconstruction as basis for the manipulation tasks
- Assessment of crop conditions at plant level for early detection and actuation

3

Biocontrol mechanisms manipulation and distribution
- Visual servoing for plant approaching manoeuvres
- Precise manipulation and arm control
- Biocontrol mechanisms storage and smart distribution

4

Robot interface for operations
- Easy monitoring and teleoperation
- Autonomy modes for different control strategies
- Synchronization of data and integration into farm management systems