AI-Autonomous Robots for Agriculture – Weeding with Laser

WeLASER Summer School

Funded by the Horizon 2020 programme of the European Union

CSIC — CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

FUTONICS

LZH — LASER ZENTRUM HANNOVER e.V.

UNIVERSITY OF COPENHAGEN

AGREENCULTURE — Smart robots for smart farming

COAG

ALMA MATER STUDIORUM — UNIVERSITÀ DI BOLOGNA

IETU — Instytut Ekologii Terenów Uprzemysłowionych

GHENT UNIVERSITY

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Introducing the Centre for Automation and Robotics

Pablo Gonzalez-de-Santos
pablo.gonzalez@csic.es
July 13, 2023

- **The Centre for Automation and Robotics (CAR) is a Joint Centre for Shared Ownership between the Polytechnical University of Madrid (UPM) and the Spanish National Research Centre (CSIC).**

CENTRE FOR
AUTOMATION AND ROBOTICS
CAR

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POLITÉCNICA

CSIC
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- **Only CSIC personnel participate in WeLASER**

- **Spanish National Research Council (CSIC)**
  - CSIC is the largest public multidisciplinary research organisation in Spain, covering almost all areas of knowledge.
  - About 11,000 employees, including more than 3,700 researchers.
  - 123 Institutes/Centres in Spain and a delegation in Brussels.

CSIC headquarter

WeLASER Summer School

- **Centre for Automation and Robotics**

  ❑ It has as a major goal to carry out RTD regarding the analysis, design and synthesis of automatic control systems and robotics.

  ❑ About 80 people, including 35 researchers (CSIC campus).

  ❑ Located in Arganda (22 km from Madrid).

Centre for Automation and Robotics (CAR)

Building A

Building B

High Bay Lab.

CSIC — CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

- **Centre for Automation and Robotics**
  - ❑ AUTOPIA - Connected and Automated Driving
  - ❑ Advanced Automation of Machines, Highly Complex Processes and Environments
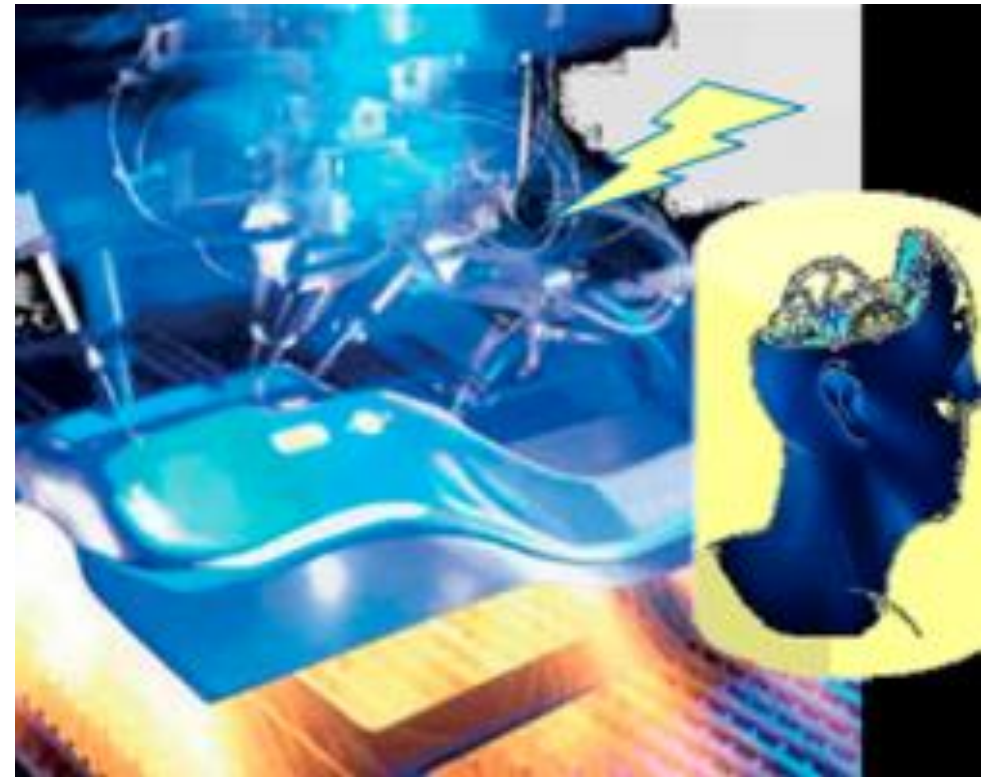 - ❑ Artificial Perception
  - ❑ Neural and Cognitive Engineering
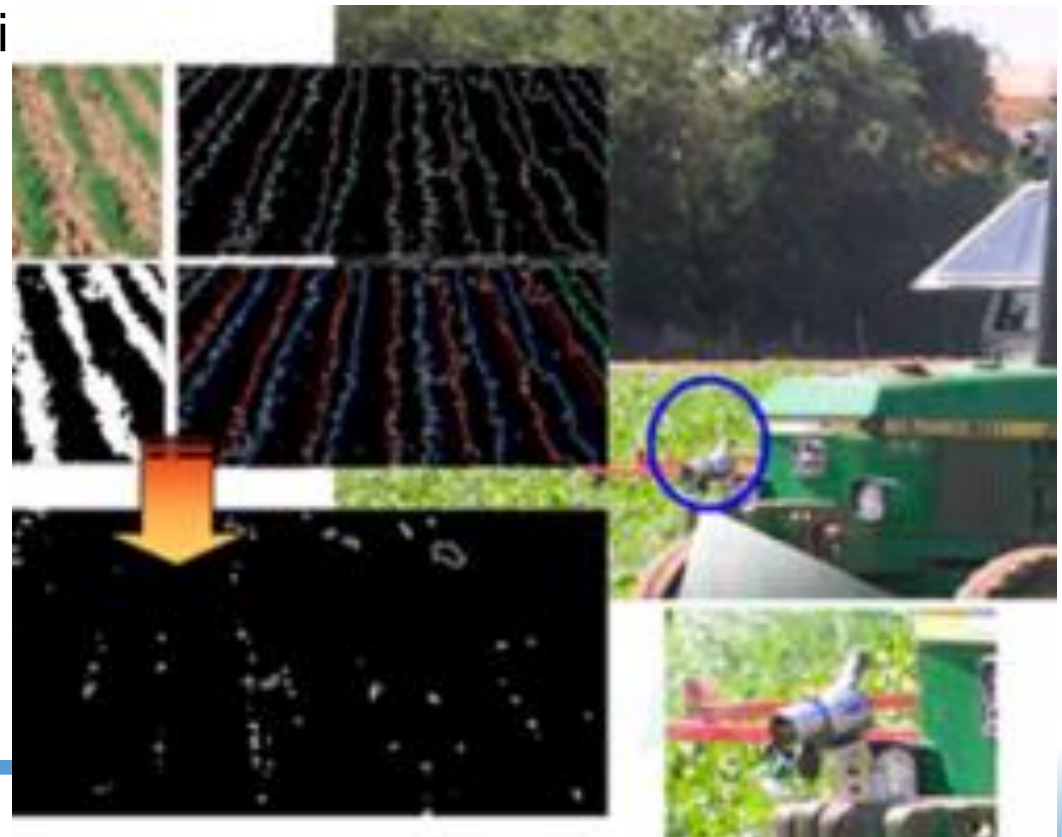 - ❑ Field and Service Robotics

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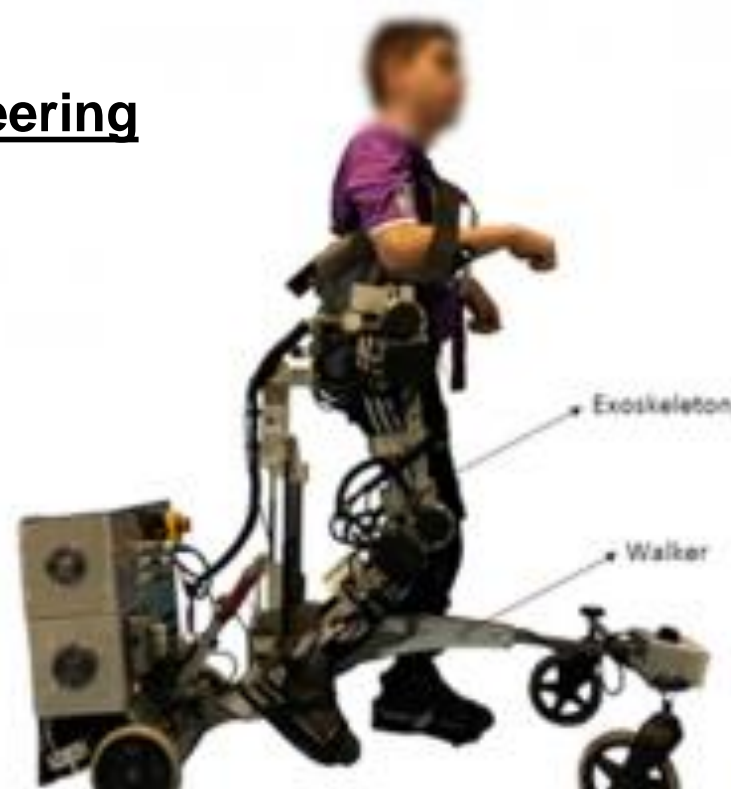 - ❑ Field and Service Robotics

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Exoskeleton

Walker

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  - ❑ **Field and Service Robotics**

Research Group: Involved in WeLASER

- **Research Group: Field and Service Robotics**
  - ❑ Manipulators
  - ❑ Mobile robots for natural environments (Walking and wheeled robots)
  - ❑ AI Perception

- **Activities in agriculture: Perception and robotics**

  ❑ CROPS-Intelligent sensing and manipulation for sustainable production and harvesting of high-value crops FP7, 2010-2014. (M. Armada)

  ❑ RHEA-Robot Fleets for Highly Effective Agriculture and Forestry Management (FP7), 2010-2014. (P. Gonzalez-de-Santos, Coord.)

  ❑ CATCH – Cucumber Gathering – Green Field Experiments FP7 (ECHORD++), 2016-2018. (Roemi Fernandez)

  ❑ WeLASER - Sustainable Weed Management in Agriculture with Laser-based Autonomous Tools 2020-2023 (P. Gonzalez-de-Santos, Coord.).
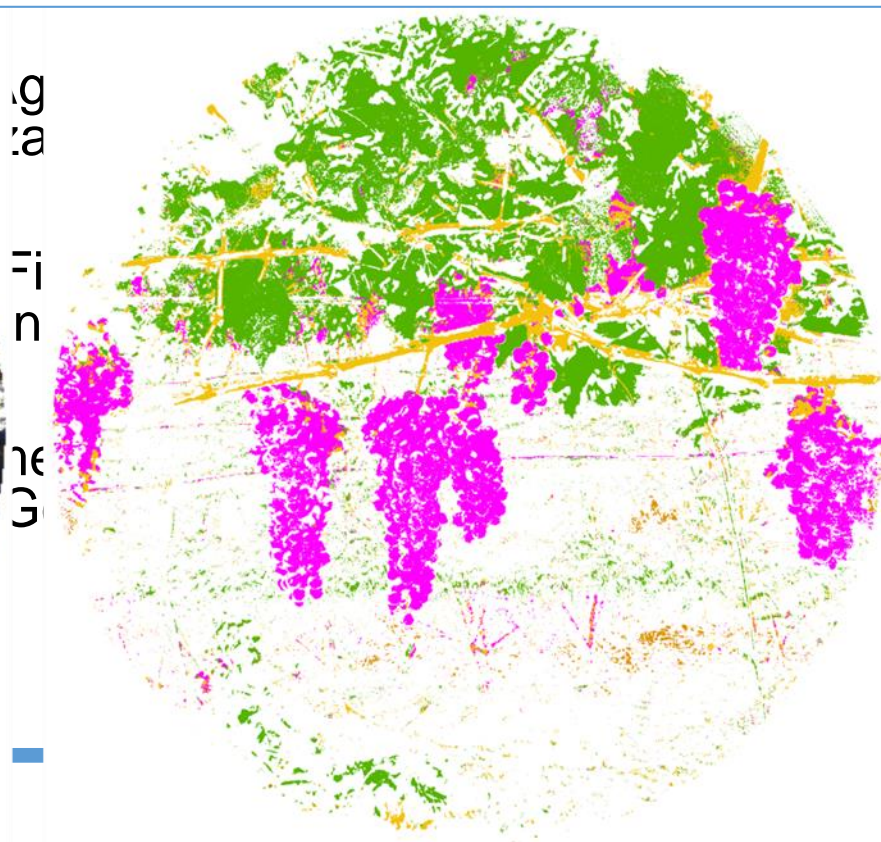
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     (ECH

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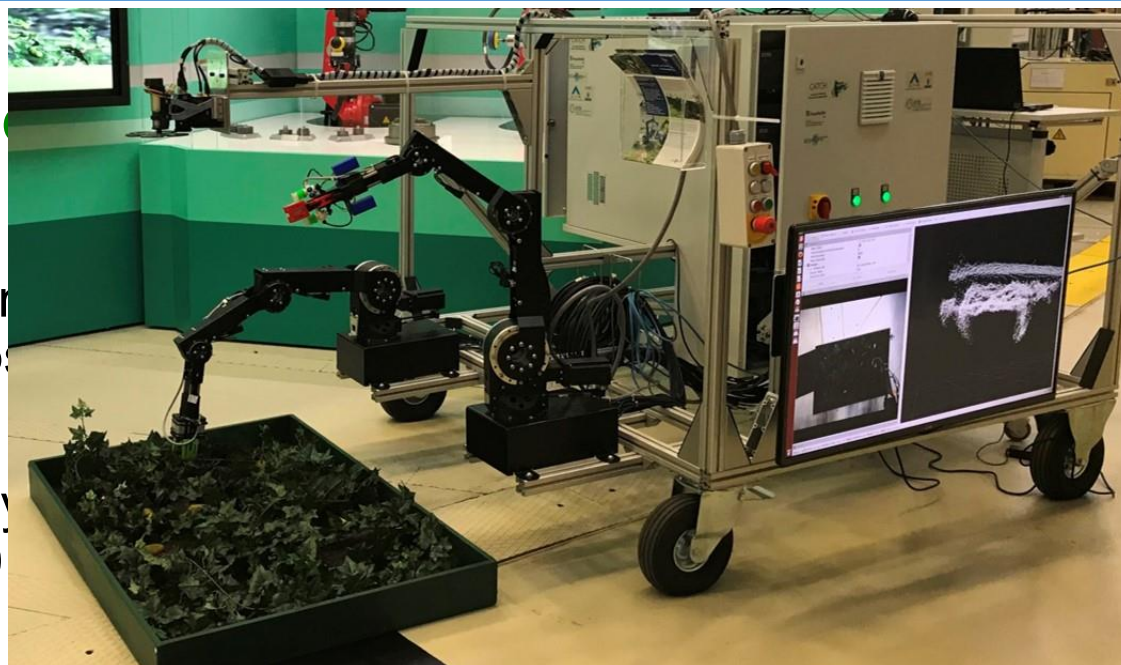 ❑ WeLASER - Sustainable Weed Ma based Autonomous Tools 2020-20

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