With the support of the Erasmus+ Programme of the European Union

UNIVERSIDAD DE ALMERÍA

TEP197 ARM
AUTOMÁTICA, ROBÓTICA Y MECATRÓNICA

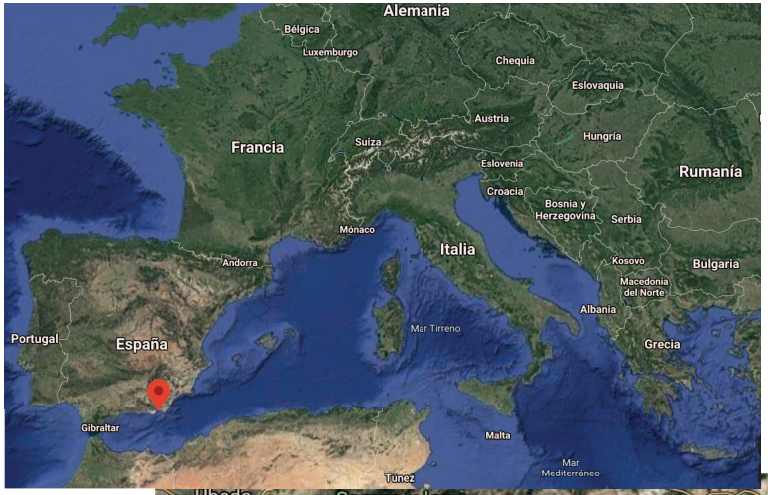
Next Generation Training on Intelligent Greenhouses

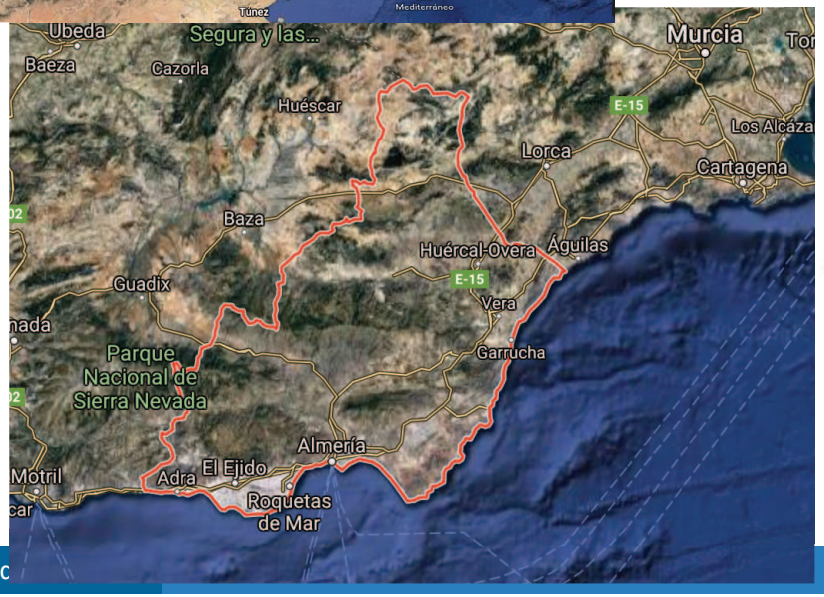
University of Almería Presentation

1st December 2020

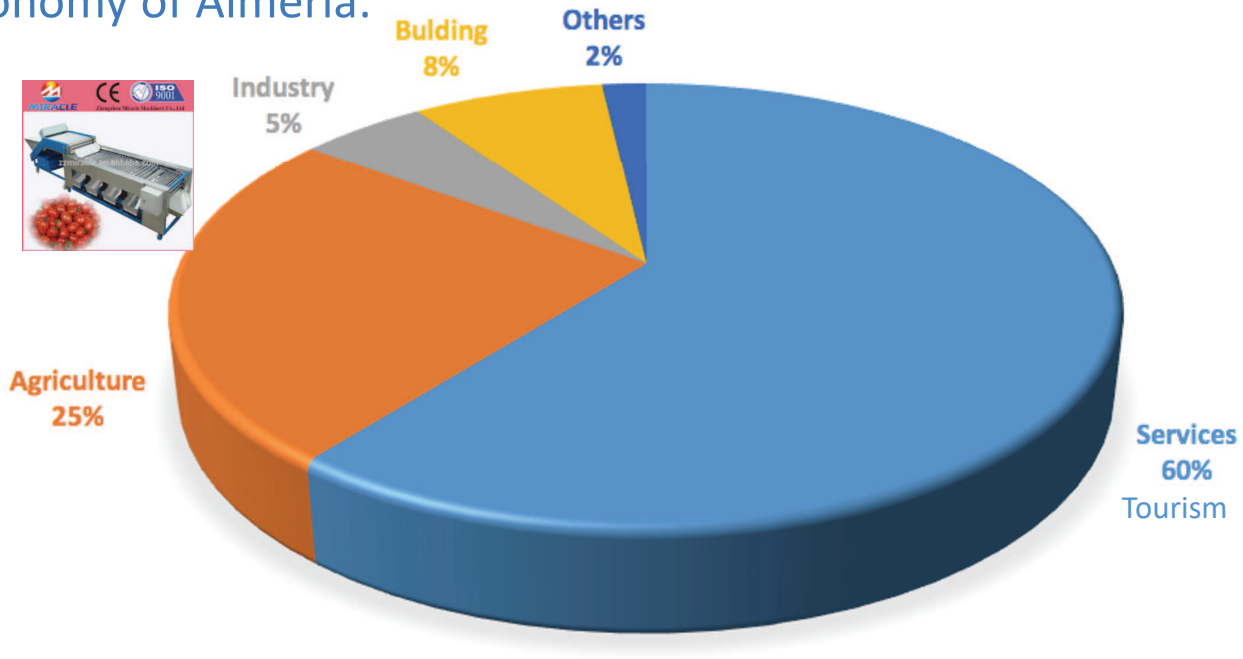
Ka Knowledge Alliances

What and where is Almería?





- Almería is a province located in the Southeast of Spain (Region of Andalusia) on the shores of the Mediterranean sea
- It is a land of contrasts: sea, mountain and desert
- Almería has the highest hours of sunshine (annual average of 3,000 hours) and lowest rainfall in Europe
- The economy of Almería:



Almeria's agriculture in numbers

The largest concentration of greenhouses in Europe is located in of Almería: 29.035 hectares

Almeria's agriculture in numbers

The largest concentration of greenhouses in Europe is located in of Almería: 29.035 hectares

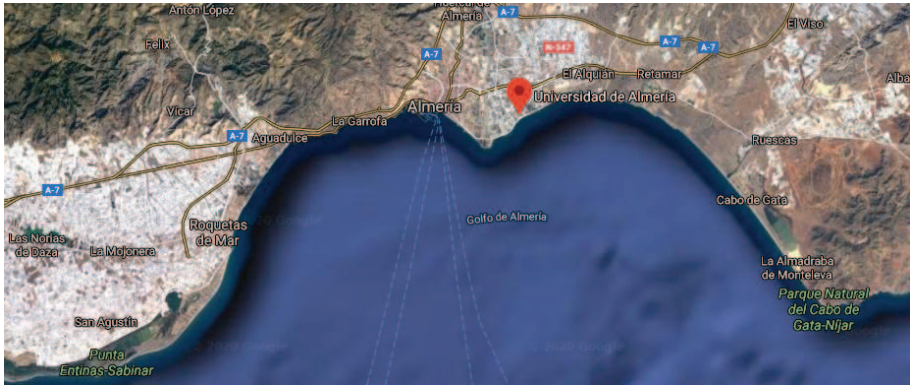
- **Products**: Tomato, pepper, cucumber, watermelon, zucchini, melon, eggplant, lettuce,…

- **Production**:
  3.375.970 tons
  with 1.803 millions € (for growers)

- **Exports**: 2.408.345 tons (75,4%),
  2.194 millions € (for exporter companies)
  - ✓ EU: Germany, France, Netherland, UK
  - ✓ Non-EU: Switzerland, Russia

University of Almería

UAL was founded by the Andalusian Parlament in 1993 https://www.ual.es/



Areas of knowledge

- **Agriculture science**
- **Industrial and Information technology**
- Natural resources and environment
- Physics and Mathematics
- Health sciencie
- Social sciencies, bussiness and low
- Humanities and Education

UAL in numbers

- 7 Faculties and the Engineering School
- 32 degree courses
- 42 Official Master degrees
- 14 doctoral programs
- **14.500 Students** (700 in of mobilities)
- **900 teachers**
- 900 international agreements

Research

It is closely related to its finantial environment focussing particularly with:

- Agriculture,
- Solar energy
- Water management

ARM Group

Automatic Control, Robotics and Mechatronics (ARM) group was founded in 2000

(TEP-197 of the Andalusian R&D plan)

https://arm.ual.es/arm-group/

ARM is **inscribed** into:

- Agrifood Campus of International Excellence (ceiA3).
- Solar Energy Research Centre (CIESOL)

Research work-lines

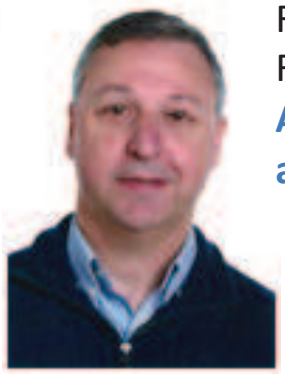
- **Modelling, control and robotics in agriculture**
- Modelling and control of photobioreactors
- Modelling and control of solar plants
- Energy efficiency and comfort control in buildings
- Autonomous vehicles and robots
- **Education in Engineering**

ARM is composed by more than 20 researchers from:

- University of Almería
- Plataforma Solar de Almería (CIEMAT)

Who is who in NEGHTRA?

Manuel Berenguel
Full Professor
Head of ARM



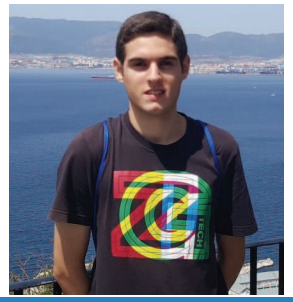
Francisco Rodríguez
Full Professor
ARM Supervisor of agriculture Work-line

José Luis Guzmán
Full Professor
ARM Supervisor of Photobioreactors Work-line

Jorge A. Sánchez
Assoc. Professor
Expert in agriculture in greenhouse

José C. Moreno
Assoc. Professor
Expert in agriculture robotics

Manuel Muñoz
PhD Student
Expert in IoT and data management in agriculture

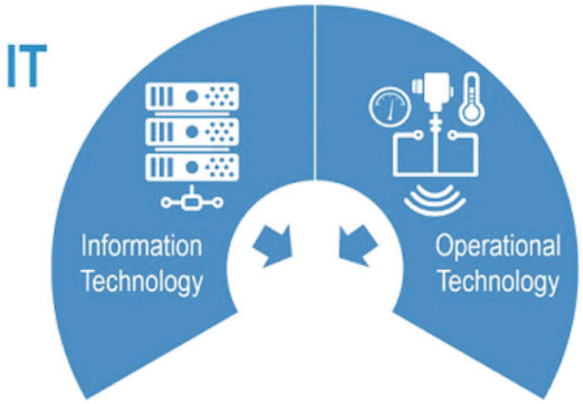


Francisco García
PhD Student
Expert in modelling and control in agriculture

Ana Fe Rodríguez Fuldauer
Erasmus+ Projects

Mª Fernanda Rodriguez Heras
Gestora de Proyectos Europeos

UAL in NEGHTRA



WP1
Analysis the potential use of OT and IT in greenhouse crop growth control and the energy and other resources consumption

WP2 LEADER
UAL will define the protocol to design and development a web-based platform for data-sharing focused on training, incorporating all the information generated in the three experimental greenhouses

WP3
UAL will help to prepare the training modules on the E-learning platform

WP4
UAL will help o implement the different sessions to trainees.

WP6
UAL will participate in the validation activities of the different modules created in the learning platform.

WP7
UAL will assess the platform

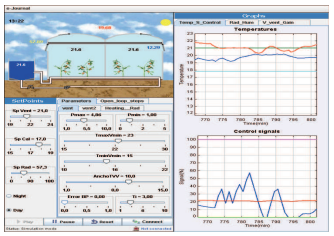
WP8
UAL will colaborate in the transfer of the results of the projects

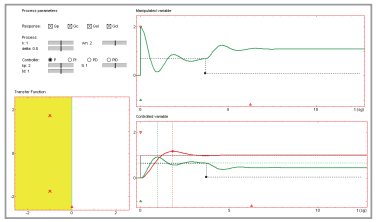
WP9
UAL will work in the Project coordination as member of steering Committee

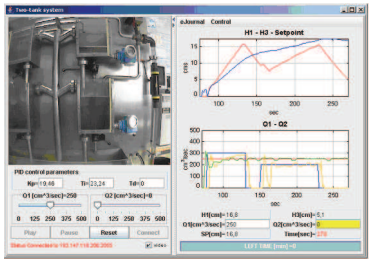
UAL in NEGHTRA

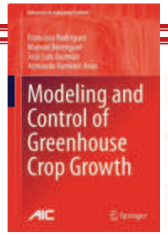
WP1

Analysis the potential use of OT and IT in greenhouse crop growth control and the energy and other resources consumption





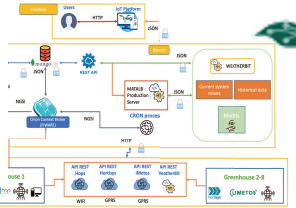


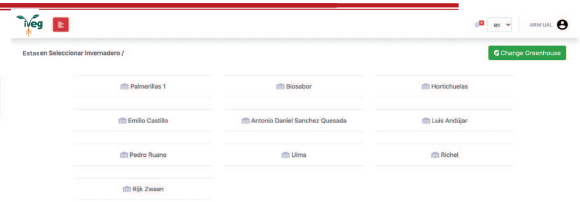


CHAPTER 8

Renewable energy technologies for greenhouses in semi-arid climates

Francisco Javier Cabrera, Jorge Antonio Sánchez-Molina, Guillermo Zaragoza, Manuel Pérez-García & Francisco Rodríguez-Díaz





WP2 LEADER

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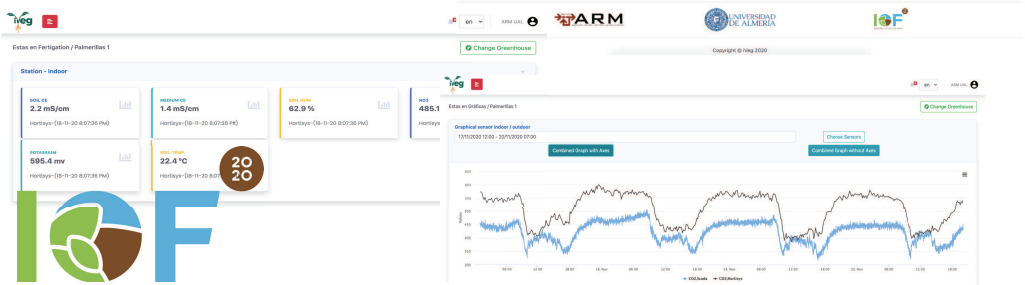

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WP3

UAL will help to prepare the training modules on the E-learning platform

WP4

UAL will help o implement the different sessions to trainees:

- Interactive tools
- Interactive books
- Virtual Labs
- Remote Labs
- Take-Home Labs

A Virtual Course on Automation of Agricultural Systems

Education Research in Engineering Studies: Interactivity, Virtual and Remote Labs

J.L. Guzmán, H. Vargas, J. Sánchez, M. Berenguel, S. Dormido, F. Rodríguez

WP8

UAL will collaborate in the transfer of the results of the projects

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