



*The Ambassador of Italy
to the United Arab Emirates*

Prot. 1890/C

Abu Dhabi, 20 Dicembre 2020

Gentile Prof. Vieri,

La ringrazio molto per aver preso parte al webinar *AGRI-TECH AS A KEY FOR FOOD SECURITY* tenutosi lo scorso 9 dicembre nel quadro dell'iniziativa "InnovItaly UAE".

Anche grazie al suo qualificato contributo, il pubblico emiratino che ha assistito all'incontro ha potuto disporre di informazioni approfondite sulle direttrici della ricerca e dell'innovazione italiane in questo settore, anche nella prospettiva di eventuali collaborazioni bilaterali.

Mi auguro quindi che vi siano presto ulteriori occasioni di interazione tra i due ecosistemi dell'innovazione in questo ambito.

Molto cordialmente, *e con i migliori auguri
di Buone Feste,*


Nicola Lener

Prof. Marco Vieri
Professore Università di Firenze e Aitronik srl
Firenze

ROBOTICS IN AGRICULTURE: THE NEW FRONTIER FOR SUSTAINABILITY AND RESILIENCE?

Prof. Marco Vieri

**innov
Italy
UAE**

*The Embassy of Italy to the UAE,
in collaboration with Khalifa University
and Dubai Future Foundation,
presents a*

LIVE E-FORUM

**AGRI-TECH AS A KEY FOR
FOOD SECURITY**

*Enhancing our partnership
to prepare our future*

*Wednesday, 9 December 2020
1pm GST | 10am CET*



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E TECNOLOGIE AGRARIE,
ALIMENTARI, AMBIENTALI E FORESTALI



ITTA
ITALIAN TRADE AGENCY



جامعة خليفة
Khalifa University



TOWARDS
EXPO

ITALIA
LA BELLEZZA UNISCE LE PERSONE
BEAUTY CONNECTS PEOPLE
الجمال يجمع الناس

CURRENT CHALLENGES

1. There is a need for sustainable intensification of agriculture worldwide, with a **lower impact** on the resources available to us
2. **In particular** for the **Middle East** where the quantity of arable land and water is extremely low
3. **Mitigate** these agricultural limitations is a challenge to ensure greater **food availability**
4. Increase the **resilience** to **pandemics** has become a must-have after the Covid19 outbreak
5. **Smart Farming** could be a valuable tool in this context to improve production sustainability.



AGRIFOOD SUPPLY CHAIN TRANSFORMATION

PRODUCTION



- Field and machine sensors
- Aerial Drones
- Satellite imagery
- DDS
- Data on production process
- New SmartFarming Approach

TRANSFORMATION



- Quality check sensors
- Big Data Analytics
- Systems for dematerialization
- Integrated traceability

DISTRIBUTION



- Systems for logistics optimization
- Ecommerce and Food Delivery
- Blockchain

CONSUMPTION



- Smart labels
- Sensors for waste reduction
- Meal kits
- Big Data Analytics

Over 50.000 students, 1.550 researchers and professors, 4.240 workers, 10 Schools

The Department of Agricultural, Food Environment and Forestry of the University of Florence (www.dagri.unifi.it) is part of the School of Agriculture and encloses more than 150 structured researchers, besides technicians, PhDs, found researchers

The Biosystem Engineering Division of DAGRI (www.agrismartlab.unifi.it) has participated in numerous projects related to precision agriculture and digitalization of the sector on a regional and European scale

Since 1924 Farm Machinery development in both national and international contest

close cooperation over several decades with the Ministerial Overseas Institute of Agriculture in Florence

Development of regional digital platforms for Precision Agriculture:

- Georeferenced plot analytical accounting
- Traceability
- Wine quality
- Biodiversity footprint



Adoption and diffusion of innovation and Knowledge in agriculture :

- Moodle and MOOC courses



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UNIVERSITY OF FLORENCE

Since 1995 Development of technologies for sustainable management in Precision Agriculture:

- VRT,ITC, telemetry, GIS
- Proximal and remote sensing (UAV satellite)
- Fleet control, **Robot**



SMASH project EU (Smart Machine for Agricultural Solutions Hightech) 2018-2020



THE RHEA project EU (Robot Fleets for Highly Effective Agriculture and Forestry Management)

Over recent years experience of Agrismart Lab in Agricultural robot

1. SMASH project
2. RHEA project

Aitronik is an Italian company that designs software for **Autonomous Ground, Aerial, and Marine Vehicles**. We are located in Pisa, the Italian cradle of Robotics.

In 2007 we **pioneered technologies for self-driving cars** by participating at the DARPA Urban Challenge with the Ohio State University. We have developed and integrated software into Autonomous cars, off-road vehicles, fixed-wing aircraft, helicopters, multi-rotors, robotic lawn-mowers, underwater vehicles, and boats, for industrial partners.

We raise the bar of industrial research by participating in projects funded on a **regional and European scale**.

Aitronik is member of the Italian Association for Artificial Intelligence (AIXIA) and HIPEAC, the European network for researchers in Computing Systems.



Ground



Marine/submarines



Aerial

EXAMPLE OF COLLABORATION PROJECT: COMP4DRONES



Keywords: **Safe software and hardware** drone architectures, **Robotic cooperation**

51 European partners, 5 use cases

Budget: ~28.4M€

Target: Safe drone architectures for transportation, inspection, logistic, **precision agriculture**, parcel delivery

Italian use case: tight integration of aerial and ground robots for Precision Agriculture

AITRONIK is responsible:

1. to integrate Sensor Fusion, Autonomous Guidance, Navigation, Control, Perception, AI components, into the **ground rover**
2. to develop and integrate the **cooperation** with the aerial drone

COLLABORATION SCENARIO

1. UAE is quickly growing and eager of solutions, many desert lands can be converted into fertile soil
2. UAE even more resilient with massive and differentiated production of food
3. Our italian high technology pole has competencies and structures to cooperate to develop appropriate Hight tech & Digital innovations for the SmartAgriculture, .
4. Through the Embassy of Italy in UAE, the University of Khalifa, and Dubai Future Foundation, the following collaboration scenarios che be setup:
 - a. Industrial & Research partnership (joint projects, joint ventures, etc.)
 - b. Investments into start-up capital stock
 - c. Students exchange programs for universities / research centers



NUVIBOT EXPERIENCE

HTF&DIG INNOVATION PARTNERSHIP POLE IN TUSCANY

Agricultural autonomous robot for Viticulture and

1. Complete automatic farms in floricultures, nursery, and vineyards
2. Autonomously guided robot for automatic spraying and weeding
3. 50-60% water and fungicide saving
4. 24/7 work, automatic battery charge
5. Increase of food quality and environmental protection
6. Social innovation



Image credits: [TheTimes.co.uk](https://www.thetimes.co.uk)

NUVIBOT (PARTNERS)

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Project Coordinator

Unique expertise in Autonomous Vehicles technologies



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DEPARTAMENTO DI SCIENZE
E TECNOLOGIE AGRARIE,
ALIMENTARI, AMBIENTALI E FORESTALI

Scientific Coordinator

Worldwide known for Machinery in Agriculture



UNIVERSITÀ DI PISA

RFID techs for Navigation

Internationally renowned for research in radio communications



SIRO PACENTI

Use case provider

Prize for Best Wine in the World in 2019



PIANTE MATI

DAL 1909

Use case provider

Internationally known for nursery



PAZZAGLIA

MACCHINE PER IL VIVAISMO

Machine Manufacturer

Market Leader in machines for nursery

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