Challenges for IoT in precision farming and smart agriculture

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Outline

- Smart Farming: Let’s Start
- Smart Farming: Enabling Technologies
“We are using computer vision, robotics, and machine learning to help smart machines detect, identify, and make management decisions about every single plant in the field”
With an estimated 9.6 billion people on the planet by 2050, overall food production will need to double in a relatively short period of time to meet the demand.
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<th>1900</th>
<th>1950</th>
<th>1990</th>
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<td>Hand Tools</td>
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Cyber-physical Systems
FUTURE FARMS
small and smart

SURVEY DRONES
Aerial drones survey the fields, mapping weeds, yield and soil variation. This enables precise application of inputs, mapping spread of pernicious weed blackgrass could increasing Wheat yields by 2-5%.

FLEET OF AGRIBOTS
A herd of specialised agribots tend to crops, weeding, fertilising and harvesting. Robots capable of microdol application of fertiliser reduce fertiliser cost by 99.9%.

FARMING DATA
The farm generates vast quantities of rich and varied data. This is stored in the cloud. Data can be used as digital evidence reducing time spent completing grant applications or carrying out farm inspections saving on average £5,500 per farm per year.

TEXTING COWS
Sensors attached to livestock allowing monitoring of animal health and wellbeing. They can send texts to alert farmers when a cow goes into labour or develops infection increasing herd survival and increasing milk yields by 10%.

SMART TRACTORS
GPS controlled steering and optimised route planning reduces soil erosion, saving fuel costs by 10%.
The investor
“We are using computer vision, robotics, and machine learning to help smart machines detect, identify, and make management decisions about every single plant in the field”
Tracciabilità e sicurezza
Guida automatica
Automazione per raccolta, semina e operazioni
Monitoraggio delle colture e Analytics
Sistemi di visione
Sensoristica avanzata
Interfaccia uomo-macchina
Tecnologie IoT
Diffusione delle singole tecnologie nel settore
Trend dei prossimi anni: un tentativo di classificazione

- Monitoraggio e cloud
- Interfacce uomo macchina
- Veicoli autonomi
- Robotica
GRAPE: an agriculture robotics project
Motivation (I)

Deployment of pheromone dispensers for mating disruption of grape moths in vineyards

**Eudémis (Lobesia botrana)**

**Cochylis (Eupoecilia ambiguella)**

Among the extend variety of grape moths, these two species are considered representative enough.
GRAPE addresses 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)*.

- Autonomously perform *vineyard scouting* with UGVs. If a problem is detected, the agronomist can teleoperate the required analysis.
- Deployment of *pheromone dispensers* with a mobile manipulator.
Cloud integration

Synchronization of data and integration onto VITIROVER UI and FMI’s
Challenge? Personal Farming

FOOD WITH PURPOSE
Everyone deserves food that’s healthy, craveable, and clean for you and the planet.

Read More

This company wants to build a giant indoor farm next to every major city in the world
A young Silicon Valley startup called Plenty thinks it has cracked the code on indoor farming.

Read More

Jeff Bezos-backed indoor farming startup Plenty opens 100K square-foot facility in Seattle region
Plenty’s next (and first full scale) farm will open in Seattle in 2018, bringing locally-grown, backyard-quality, and affordable produce to area consumers by the middle of the year.

Read More

Tesla's Former Battery Director Joins Farming Startup Plenty
Tesla Inc.’s former director of battery technology has joined Plenty Inc. to lead the vertical farming startup’s plan to build indoor growing rooms around the world.
Hexagro Urban Farming launching its first crowdfunding campaign!

Be your own trustworthy producer!
Scale up and grow more!

- Unpack and assemble
- 4 Module Kit
  - 24 vases
- 7 Module Kit
  - 42 vases
- 13 Module Kit
  - 78 vases
Hexagro

Pesticide Free
Know where your food comes from and preserve a good fresh quality.

Grow Fruits and Vegetables
Grow several kinds of crops of fresh, healthy and nutritious organic food.

Profit from your Food
Buy less, grow more. Scale up your system and maximize yield.

90% Less Water
High efficiency Aeroponics for low consumption of water and energy.

Increase Local Production
Harvest in less than two months with low time in maintenance.

Reduction of Greenhouse Gasses
Protect the environment with our circular economy model.
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