ICT-AGRI-FOOD 2019 Cofunded Call Newsletter

December 2021

Dear ICT-AGRI-FOOD community,

The year 2021 is coming to an end and we hope that you and your loved ones are in good health. Hopefully, the year was successful for you despite the Corona pandemic.

With the December newsletter, we wish you a merry Christmas and that you enjoy the holidays with family and friends and come well into the New Year! We thank you for the exciting discussions in our events and your loyal interest in our project.

Currently, ICT-AGRI-FOOD is preparing a new call for 2022, and we think that in our domain, promoting digital technologies for strengthening the sustainability, fairness and resilience of agri-food systems along the whole value chain, there are still many challenges to tackle. Among other things, many farmers and other actors along the value chain are still reserved to embrace new digital technologies and share the data they generate with digital devices with other stakeholders. There is a lack of trust, and we must work on this issue. However, getting data out of the silos and making the best use of them is very important for the sector to move forward. We also hope to contribute to progress in the areas of transparency and food traceability during the remaining three years of the project. We are curious to see the final call text of the 2022 Joint Call.

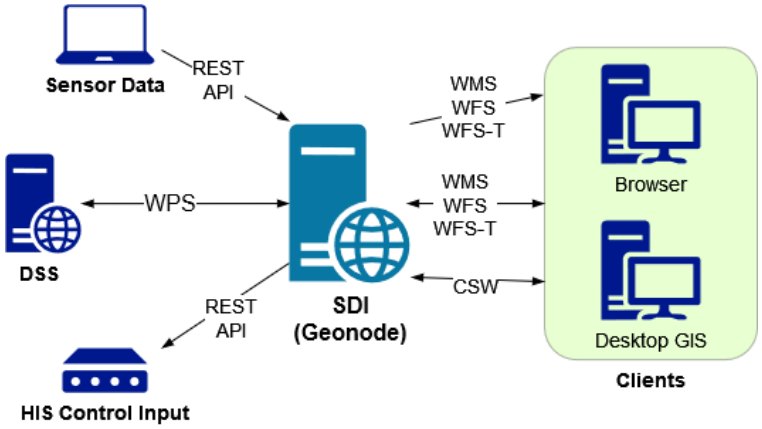
In this newsletter, you can find information on the latest developments and achievements from all projects of the 2019 Cofunded call.

Stay with us and let's work side by side for the use of modern technologies for a more sustainable food system. Over Christmas, there is however hopefully time to relax a moment. All the best, stay safe and sound.

Yours sincerely,

Johannes Pfeifer, Member of ICT-AGRI-FOOD's Coordination Team

ICT infrastructure of ADDFerti



- **A** Data-**D**riven Platform for Site-Specific **Ferti**gation -

One of the challenges in precision farming is the heterogeneity of the data and the sensors including both proximal and remote sensing tools. Particularly for this project, the geographic distance between the project partners needs also to be taken into consideration. To mitigate this, ICT systems need to be developed, which can work with different data sources and are also easy and intuitively to operate. The goal of the intended fully automated web-based spatial data infrastructure (SDI) to be developed under ADDFerti is that sensor data can be retrieved and processed online, feed into web processing services and get real-time recommendations for precision farming applications.

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BeeConnected - How helping beekeepers limiting colony losses and related economic deficits?

Over the past 20 years, the substantial and global decline of bees has been alarming as they provide critical pollination services. In particular, the mortality of honey bee colonies (Apis mellifera) has attracted a lot of attention due to its important role for human well-being by producing honey, sustaining populations of wild plants and supporting production of major crops. Unfortunately, abnormal high mortality rates of honey bee colonies have been revealed in several regions of the world, including Europe where it can reach up to 25–50% every winter. These mortality rates have strong impacts on beekeeper economy and sustainability, and consequences for associated services.

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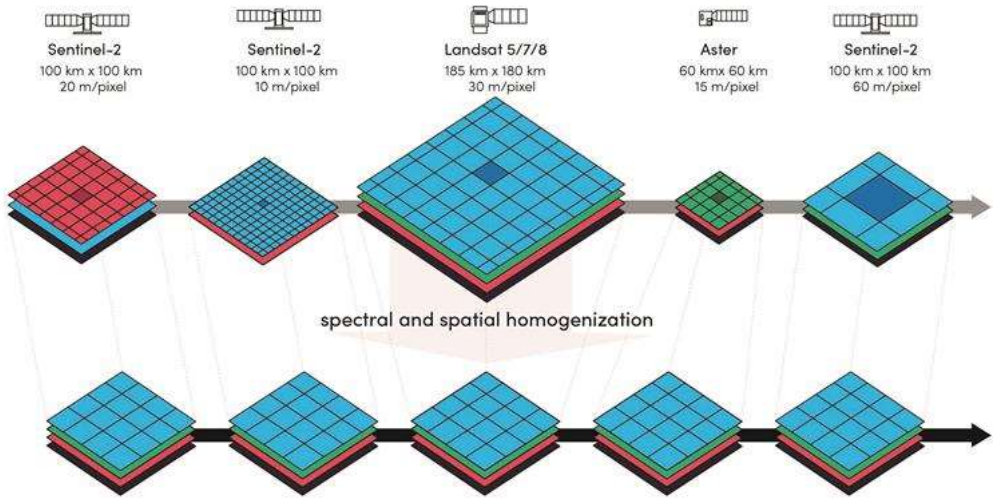
FINDR - provides easy access and integration of satellite imagery



In next year's growing season, the FINDR platform will already be used by our Value Added Service Provider (VASP) in a field trial on several farms in Brabant, Limburg and Flevoland, Netherlands. However, what are the benefits and one of its main features, the FINDR platform provides?

In this project, a team consisting of ConstellR, Cyfronet, eLEAF, Fraunhofer EMI and Helmholtz Centre Potsdam GFZ develops the Information and Communication Technology (ICT) platform FINDR.

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GOhydro - A smart-sensing, AI-driven platform for Hydroponic microgreens cultivation

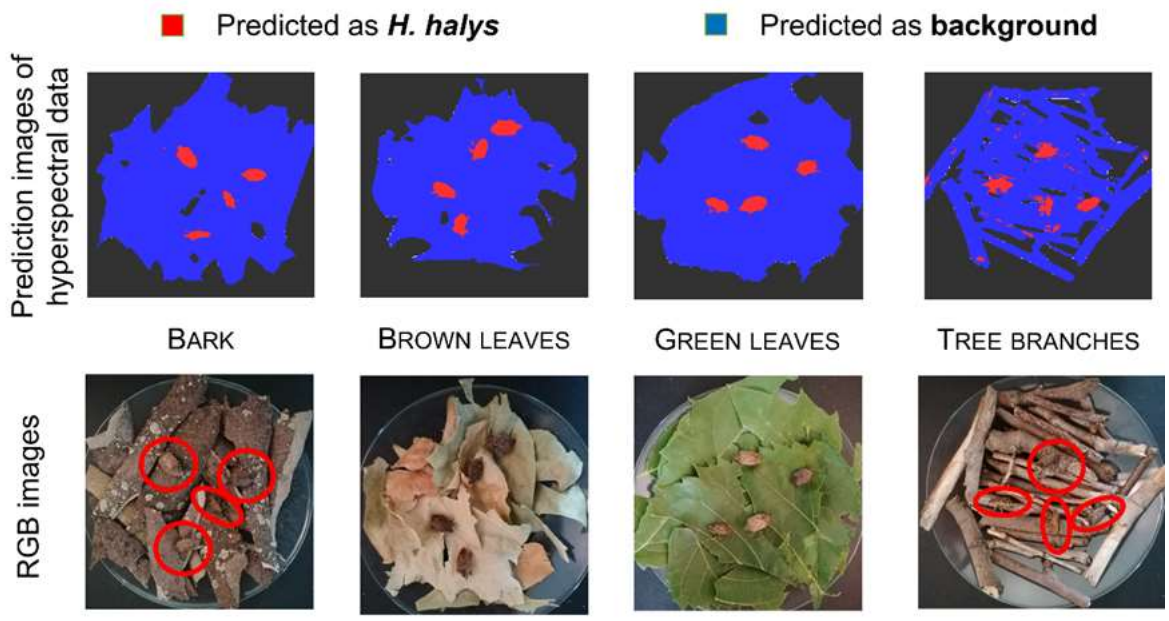
GOhydro develops a smart platform for optimising hydroponic cultivation in home settings, with minimal costs and maintenance needs. In the bigger picture, GOhydro aspires to introduce advanced AI in tools accessible and usable by everyone.

In the global landscape shaped by climate change and the COVID-19 pandemic, alternative forms of agri-food production like vertical and urban farming can prove particularly beneficial for the environment, the food value chain and, ultimately, citizen health and wellbeing.

In this direction, SCiO (https://scio.systems/) coordinates GOhydro, to develop a smart-sensing, AI-driven hydroponic platform for home settings.

Read more

HALY.ID - Near infrared image sensors for monitoring insect pests in crop fields



In the frame of **HALY.ID** project, the present study aims at investigating the potential of near-infrared spectral cameras for monitoring the presence of the brown marmorated stink bug (*Halyomorpha halys*) in crop fields.

Field monitoring of insect pests is fundamental in crop management to gain information about presence and abundance of pests to timely adopt proper actions to face infestation and avoid economical losses. Traditional methods for monitoring insect pests imply direct inspection of the field by technicians, which is time and money consuming, or the use of traps, which are not always reliable and may eventually have the drawback of increasing crop damage around the trap.

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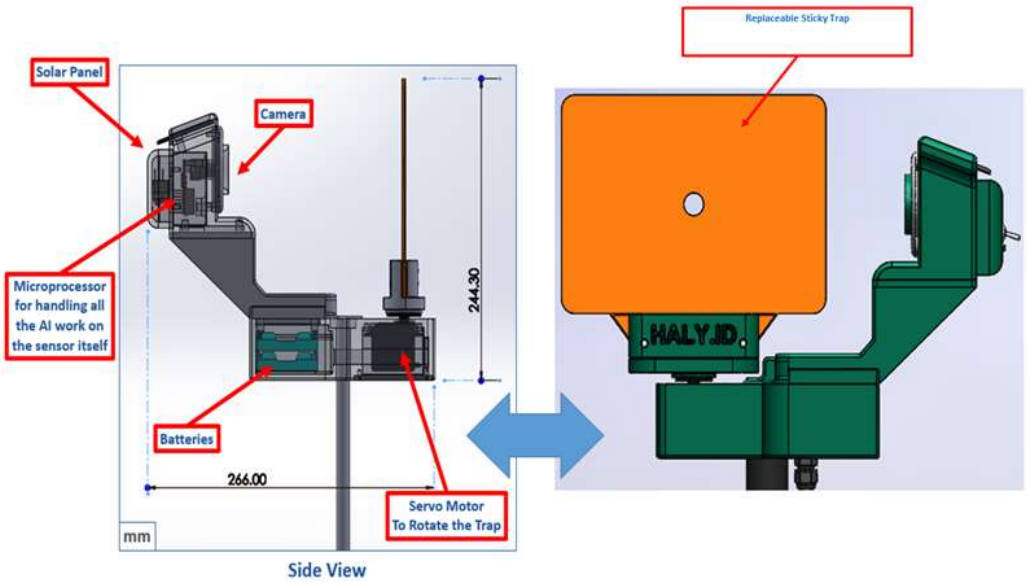
HALY.ID - Novel Smart Trap with Edge AI for Pest Insect Monitoring

Automated Insect Pest Monitoring System

Integrated Pest Management (IPM) strategies, such as physical barriers, crop rotation, or monitoring traps play an important role in helping growers manage insect pest populations in their crops. Effective implementation of IPM strategies is critical to minimise crop loss and pesticide use, thus ensuring the sustainability and economic viability of crop production. Monitoring for insects and insect damage is an integral part of the IPM. However, it is a time consuming process that requires frequent crop inspections and reliable monitoring tools. Continuing international trade and climate change ensure the continual threat of new insect pests entering into Europe. The proliferation of HH in Europe is a good example of that. It was first reported in southern Europe in the early 2000's, with recent losses in Italian fruit orchards being reported in the hundreds of millions of euro each year. Moreover, HH continues to spread towards northern Europe including the United Kingdom where multiple interceptions have been recorded since 2020. The example of HH invasion highlights the urgent need for better tools for insect pest monitoring.



Halyomorpha halys (HH), is an invasive shield native to East Asia. Due to climate change and global trade, it has arrived in Europe where it is causing significant losses in food production. As part of the HALY.ID project, we propose to develop a novel smart trap for automated insect monitoring.

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LivestockSence - Better usage of Smart Technologies in agriculture to benefit farming, climate and animal welfare

LivestockSense initiates important steps towards (1) developing a better understanding of the attitudes of farmers for technology use and thus (2) ensuring more efficient adoption of Smart Technologies in agriculture. The project focus is on pigs and poultry across five EU countries and Israel, where farmers will be approached to provide information about their perceptions and experiences of adapting Smart Technologies on livestock farms. The main findings of the surveys will be published and will provide the basis for live demonstrations of Smart Technologies on commercial livestock farms.

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MUSHNOMICS - Unlocking data-driven innovation for improving productivity and data sharing in mushroom value chain

MUSHNOMICS objective is to demonstrate the feasibility of dynamic data-driven analytics for multi-domain mushroom production environments in order to optimize yield, lower costs and improve the economic viability of this agri-food sector. It takes a full-chain systems-based approach, from producer to consumer and beyond (valorisation). Consequently, MUSHNOMICS mobilizes a balanced and meaningful research-practice partnership (50-50 research-business split), including research-intensive academics with strong industry involvement from Denmark, Hungary, Ireland and Romania.

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POSHMyCo - Potential of selective harvest based on mycotoxins content assessment in cereal crops

The project aims at the use of proximal and remote sensing that encapsulate advanced imaging technologies with the combination of artificial intelligence (AI) for the effective management of Fusarium Head Blight (FHB) and the mitigation of mycotoxin contamination through selective harvesting in cereal crops.

What happens when you consume contaminated food with DON?

DON, an important mycotoxin produced by FHB infection, causes vomiting, abdominal pain, diarrhea, nausea, headache, and fever in humans. To protect public health, safe maximum levels of DON in foods are enforced in European Union Regulation (EC) No 1881/2006, which range between 0.2 and 1.75 mg/kg (depending on the food types). In POSHMyCo, we will set a novel method for selectively harvesting the grains based on DON level into three categories: human consumption (≤1.25 mg/kg), fodder (1.25 ≤ 8 mg/kg), and Bioenergy (>8 mg/kg)

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SHEET - Sensor fusion for detecting temperature stress in fruit orchards

Field conditions with excess solar radiation can produce sunburn in the exposed surface of fruit, compromising fruit quality, storability and enhancing food waste. Periods of high solar radiation and resulting high fruit surface temperature (FST) appear over the growing season. Therefore, the monitoring of FST within the canopy provides decisive knowledge. However, no study has been reported yet to observe the suitability of thermal 3D sensing for estimating FST in field conditions, an essential step for modeling FST and improve sunburn management strategies.

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SpectroFood - Information Agrifood quality estimation using hyperspectral techniques

The global food demand is constantly growing; as a result, we need to produce more and in a more efficient way. Moreover, food packaging's environmental impact is substantial, using lots of resources such as energy, water, and chemicals while also contributing to plastic pollution. How can we increase food production, improve the use of resources, reduce packaging without sacrificing food along the way? Spectral imaging seems to hold the promise for that, through non-destructive fruit/vegetable quality estimation and by establishing a link between pre- and post-harvest. The SpectroFood project looks into this promise by looking closely at four unique use cases: broccoli, leek, mushrooms, and apples.

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SustainIT - Releasing the Potential of ICT in Milk and Beef Value Chains

ICT is transforming agri-food sector and huge amount of data is produced daily. However, so far, the utilization of animal health and welfare data by agri-food value chain stakeholders has been hampered by considerable challenges.

SustainIT aims to identify technological, economic, social and institutional barriers of widespread adoption of animal health and welfare related ICT, and to develop conceptual solutions and business models for ICT adoption in milk and beef value chains. SustainIT uses multi-actor approach by engaging dairy and beef value chain, value network, ICT, and public sector stakeholders in the Living Labs established in Germany, Sweden, Finland and Estonia.

Read more

[UTOPIA] – a software framework for smart farming

UTOPIA is a user-friendly software framework for smart agriculture – a farming method that has the potential of increasing the yield per square meter by means of automated agricultural machinery, which provides crops with the precise treatment that they need. The aim of UTOPIA is to make smart agriculture more accessible, affordable and user-friendly.

A bottom-up approach to the development of the smart farming solution.

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Young researchers workshop

ICT-AGRI-FOOD is currently planning a Young researchers workshop, which is set up to promote young researchers in the field of Food-, Agriculture- and Data Sciences. The workshop is planned as an online event divided into 4 sessions which will be held at the beginning of 2022. This event offers researchers in the field,

especially to the younger participants, a platform to learn how to structure and work on scientific proposals. The official announcement will be published in early 2022.

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