

Lux5GCloud

Exploiting the potential of 5G, IoT, EO, cloud and ML for sustainable digital farming solutions.



Inspiration

In light of climate change, agricultural areas are facing new pressures, such as critical weather events (droughts, floods), for which farmers need accurate and real-time monitoring to manage their crops. However, these areas often lack the connectivity that would allow the development of smart applications. In this framework, a combined approach taking advantage of both 5G connectivity and advanced technologies, such as IoT and SATCOM, has the potential to move towards a Smart Agriculture.

Innovation

Based on a Smart Agriculture case study, Lux5GCloud will conduct and demonstrate the advantages of 5G and its advanced technologies to develop an innovative and secure Cloud Hierarchy Database Platform (CHDP) allowing all end-users - from farmers to scientists and policy makers - to monitor, automate, and analyse their operations.

As coordinator of this national project co-funded by the Department of Media, Telecommunications and Digital Policy (SMC), LIST will leverage its expertise in Machine Learning to integrate different source data (EO and in-situ IoT) from its partners and extrapolate relevant information according to end-user needs. LIST researchers will develop new Machine Learning algorithms capable of detecting anomalies in key parameters for crop monitoring, such as soil moisture, droughts, and plant water stress.

Besides EO images collected from satellites, and IoT data collected from in-situ sensors, Lux5GCloud will also rely on high-resolution images captured with an advanced IoT device, enabled with a camera, and 5G connectivity. In close collaboration with its partners, LIST will define the entire network architecture of this innovative system, including the 5G network provided by POST, the Cloud platform developed by InTech, as well as the satellite and IoT data managed by GOMSPACE and Frontier Connect respectively.

Impact

Lux5GCloud will enable an accurate monitoring of soil moisture shortages, which is a pre-condition for managing drought adaptation and ecosystems resilience, such as foreseen by the EU Nature restoration plan of the EU Biodiversity strategy 2030.

By conducting this feasibility study for the first national "5G Smart Farm Platform", Lux5GCloud will not only contribute to the current state-of-the-art on 5G technologies, but also open the path to follow-up projects targeting the development of a CHDP prototype in Luxembourg, and its future commercialisation on the market, in close collaboration with relevant stakeholders.

Such a Cloud platform would unlock the potential of 5G technologies for sustainable digital farming solutions and could be applied to a wide range of applications, such as natural disaster monitoring and management, among others.

Partners

Frontier Connect (LU) , GOMSPACE (LU) , Intech S.A. (LU) , POST Luxembourg (LU)

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