MultifunctiONal aI plaTform fOr eaRth obsErvation Data

OVERVIEW

In May 2019, OPT/NET was awarded a contract for a feasibility study on MultifunctiONal plaTform fOr eaRth obsErvation Data (MONITORED) by the European Space Agency (ESA).

The goal of the project was to promote the use of Earth Observation Data (EOD) from space in combination with highly local data transmitted by IoT sensors via KPN's 5G networks in the Groningen 5G Field Labs under the "5Groningen" initiative by the Economic Board of Groningen & ESA.

In the scope of this project, OPT/NET integrated our award winning platforms, "TSAR AI" and "OptOSS AI" into one common Proof-of-Concept demonstration platform providing generic analytical services to farmers for the holistic monitoring and generation of actionable insights in the precision agriculture domain. In the scope of this project, MONITORED is now being used by farms in Groningen to test the viability of the solution.

esa space solutions kpn 5GRONINGEN

THE PROBLEM

Increasingly dynamic and unpredictable weather patterns pose challenges for arable farming worldwide. Farmers often have to plan for the worst-case scenario, and ultimately under-produce and over-spend. **Frequent and timely actionable insights on crop-health and field performance are a necessity** to maximise yields in such a dynamic environment.

There are many Smart Agri solution providers on the market, who share the common goal of increasing yields and reducing costs for farmers. Many of these solutions, however, rely solely on optical imagery for their analysis.

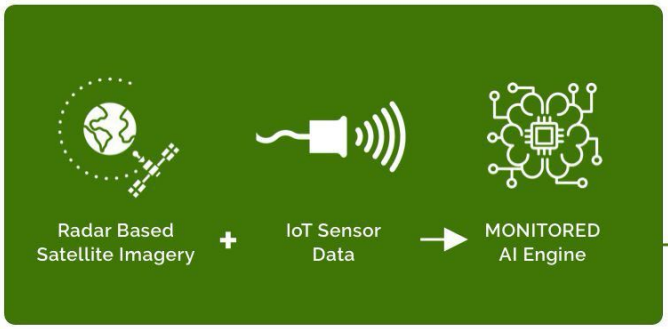
Unfortunately, the reliability and availability of high quality optical EOD is significantly degraded by the presence of clouds. Even relatively small clouds pose a challenge for the quantitative calculation of popular vegetation and moisture indexes. Although proven methods do exist to alleviate this issue, there are limits to this approach in the regions prone to frequent and prolonged cloud cover. Additionally, effectiveness of such methods is minimal for areas where weather patterns change hourly.

A ROBUST SOLUTION

MONITORED AI addresses these challenges by integrating three key technologies: **Radar Based Satellite Imagery, 4/5G connected IoT sensors & Artificial Intelligence** deployed at the Edge of the Cloud in direct vicinity of the monitored areas.

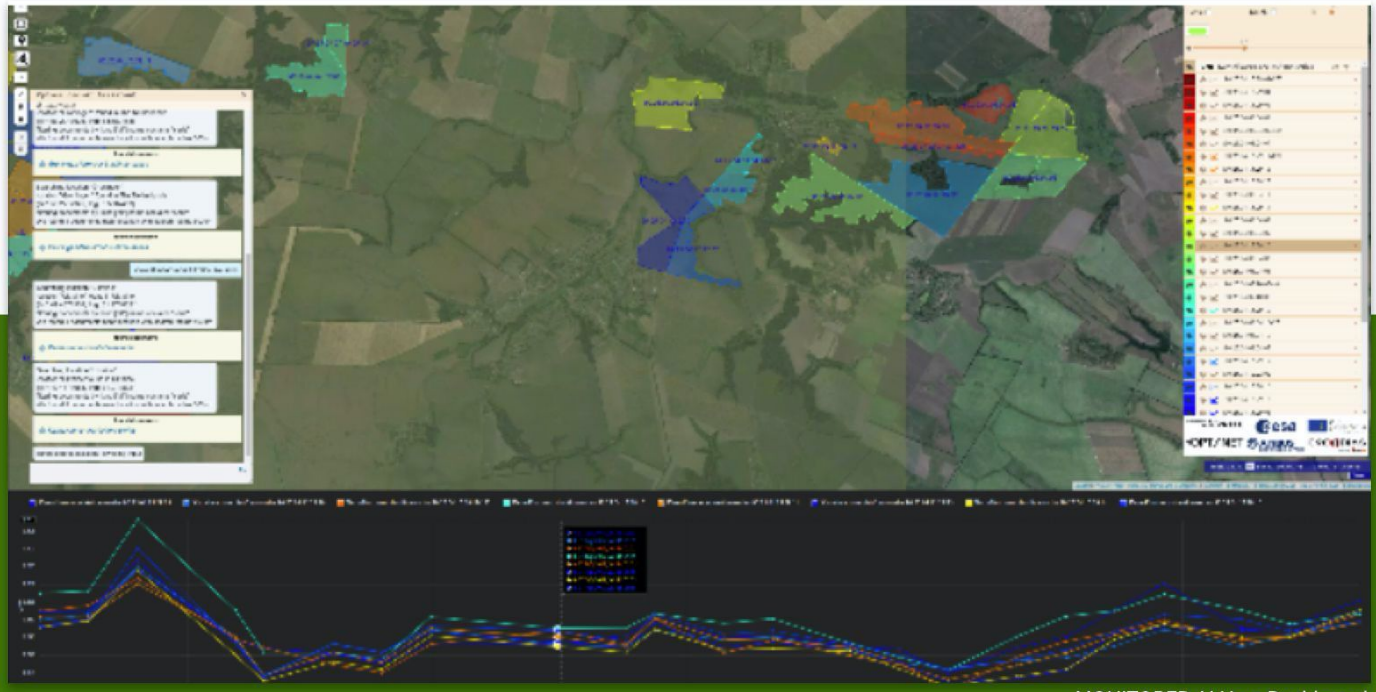
Radar Based Satellite Imagery is unobstructed by clouds & works day & night. It provides a "macro" view of the fields & can be used to map biomass, soil humidity & soil compaction. When used in isolation, radar-imagery can be tricked by water accumulation on the crops/soil. 4/5G-connected IoT sensors provide reference points with key crop metrics and can be placed in unobtrusive locations. This gives an added "micro" view on surface conditions.

Fusing these data sources presents a possibility for the generation of a very-high resolution holistic view with fewer sensors installed, but with 3x3m grid insights and reliable information unaffected by weather conditions.



The MONITORED AI-engine fuses these data-sources, analyses the streams in unison, & provides users with key insights on their fields in a user-friendly dashboard.

Within 10 mins of opening the dashboard, farmers know which areas need which treatments and can plan their activities each and every day accordingly. This will improve farming practices **ultimately leading up-to 10% increase of respective yields and >10% reduction of associated costs and wastage.**



MONITORED AI User Dashboard

NEXT STEPS

OPT/NET aims to engage in a follow-up project covering customers in compact coastal areas in 3 key provinces of the Netherlands active in the cultivation of high value crops. Here, MONITORED AI will run in production and monitor at least two entire growing seasons of an individual Farmer's crops, where estimates on actual realised yield increases will be produced and presented.

About OPT/NET B.V.

OPT/NET develops AI driven products with a focus on rapidly processing both structured & unstructured time-series data to produce business intelligence. OPT/NET currently offers solutions to the telecom, agriculture and security industries.

ESA paragraph

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www.opt-net.nl
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