Towards an EO data analytics platform to address climate change challenges: the needs from an industrial player perspective

Earth Observation Data Analytics Platform

Bruno Perrot, RHEA System Luxembourg

25 May 2023

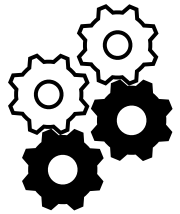
Objectives & Goals

Background

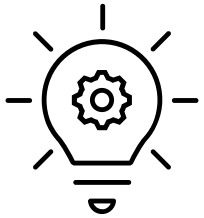
Earth Observation (EO)
Use of remote sensing technologies to gather data about planet Earth with the aim of increasing our understanding of it

Problem

Several processing and analytical steps must be performed to fully exploit the information contained in images from spaceborne instruments



Solution



Realization of an **EO Data Analytics Platform**

Goal

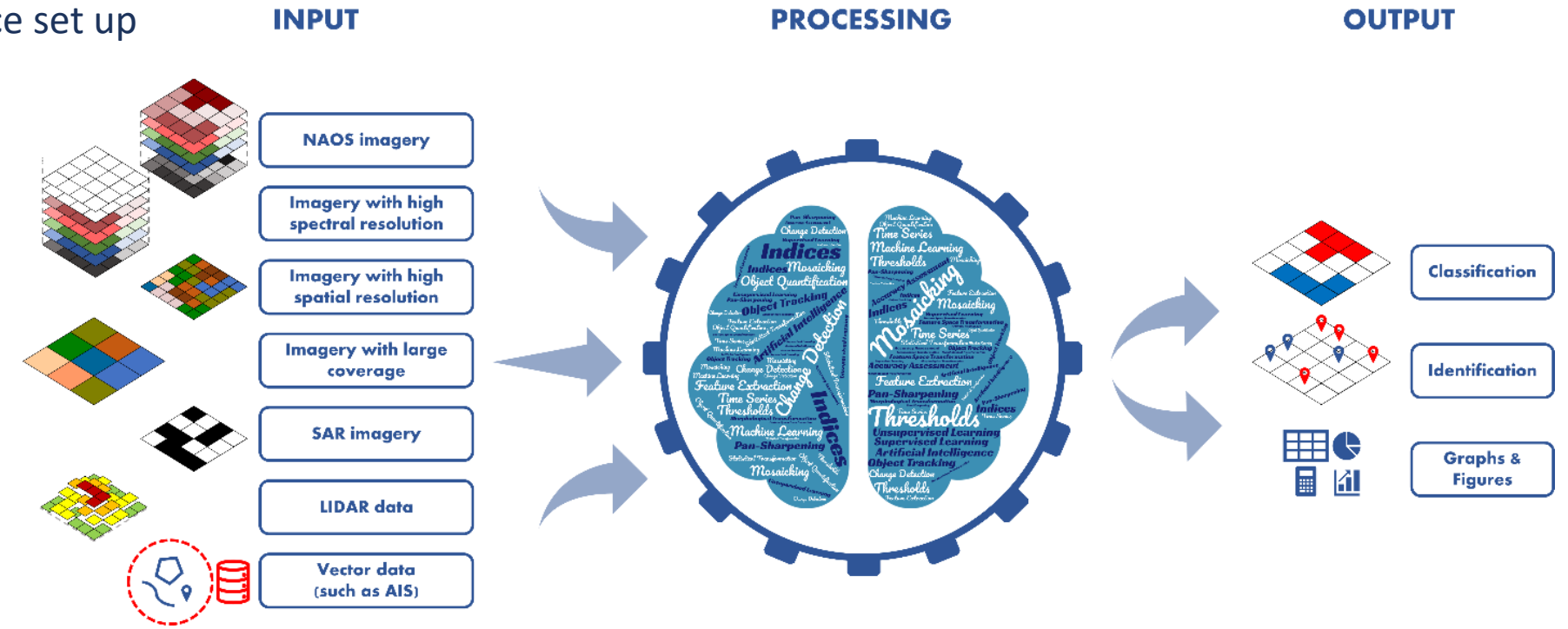
Provide refined EO data for different vertical requirements and use cases

Objectives & Goals – cont'd

- ***EO Data Analytics Platform*** aims to provide meaningful **information, insights, and intelligence (I3)** in various domains.

- The Platform will be capable of exploiting various EO data sources and formats (individually or simultaneously through **Data Fusion**)

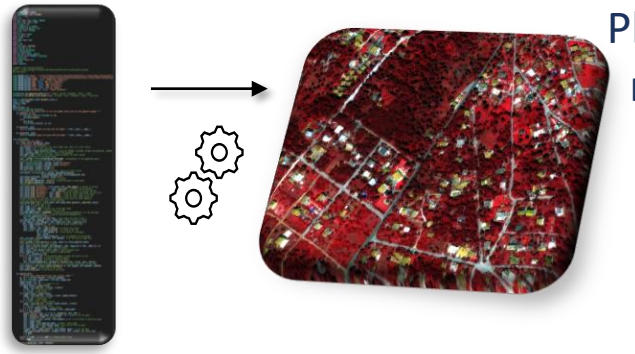
  - ✓ Completely automatic once set up
  - ✓ Cutting-edge technology
  - ✓ Artificial Intelligence (AI) algorithms
  - ✓ Strict Security
  - ✓ Multiple input sources



Platform Overview

- Basic principles of the Platform's operation

Algorithms & Data will be stored in databases connected to the Platform or pulled on the fly



Platform will autonomously run the correct algorithm and deliver the desired output product.

Services

- EDA Platform will serve both institutional and civilian applications (**Dual-Use**)
- “Dual-Use” applies not only at the **service** level but also at the **data classification** level. This means that the platform will be capable of “understanding” the confidentiality of the data
  - ✓ Defence usage: Handling of **Classified information/data**
  - ✓ Civil usage: Handling of **Unclassified information/data**

Services – cont'd

- Expected EO services are:

Service	EO Defence and Security	EO Emergency Service
Description	Provide information, insights, and intelligence (I3) to address relevant challenges	Provide timely and accurate geospatial I3, thereby supporting Emergency Response Providers, Disaster Management entities, and other interested parties during disasters.
Functions	✓ Activity Report ✓ Surveillance/Persistent Monitoring	✓ Instant Mapping ✓ Recurrent Mapping
Application	Applicable to range from Critical Asset Monitoring, Border and Coastal Surveillance, Humanitarian and Security Crises to Conflict Events	Applicable both to Damage Estimation and Assessment during Natural Disasters (floods, earthquakes, wildfires, etc.) and to support management during Humanitarian Crises

Future Plan – Benefits

- **Development of analytical capabilities**
  - ✓ Establish a modern data analytics chain,
  - ✓ Introduce **innovative** and **modern techniques** of computing, merging AI, ML and Big Data Analytics,
  - ✓ Integrate data from **multiple sources** (gov/institutional/commercial) in support of persistent surveillance from space,
  - ✓ Provide Information, Insights, and Intelligence (**I3**) (not just data).
- **Consolidate current space capabilities**
  - ✓ Enhance the **LUXEOSys** and provide **added value** to the NAOS images (not just data) (**dual-use** of NAOS imagery),
  - ✓ Ensure delivery of highly reliable data to the customers/users and high potential in even more extensive data analysis.
- **National cooperation**
  - ✓ Be beneficial to the entire **Luxembourg Space Ecosystem**,
  - ✓ Develop new competencies in **the Earth Observation** domain and cooperate with **LIST EO** department.
- **International cooperation**
  - ✓ Strengthen **cooperation & alliances** and develop new partnerships,
  - ✓ Use the **LSA Data Center**'s capabilities and Luxembourg **HPC – MeluXina** capabilities with **LUXProvide**,
  - ✓ Contribute to the collective Defence supporting NATO operational/tactical needs,
  - ✓ Enhance Luxembourg's reputation (EU & NATO) and enhance international alliances and partnerships,
  - ✓ Support Luxembourg to consolidate its role as a "major" player in Space and Earth Observation domains (Leadership).


THANK YOU
www.rheagroup.com