



EUROPEAN UNION
SATELLITE CENTRE

Analysis for decision making

20th European Interparliamentary Space Conference

Big Data for security and defence applications

“An exceptional opportunity”

Brussels, 16 October 2018

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Director

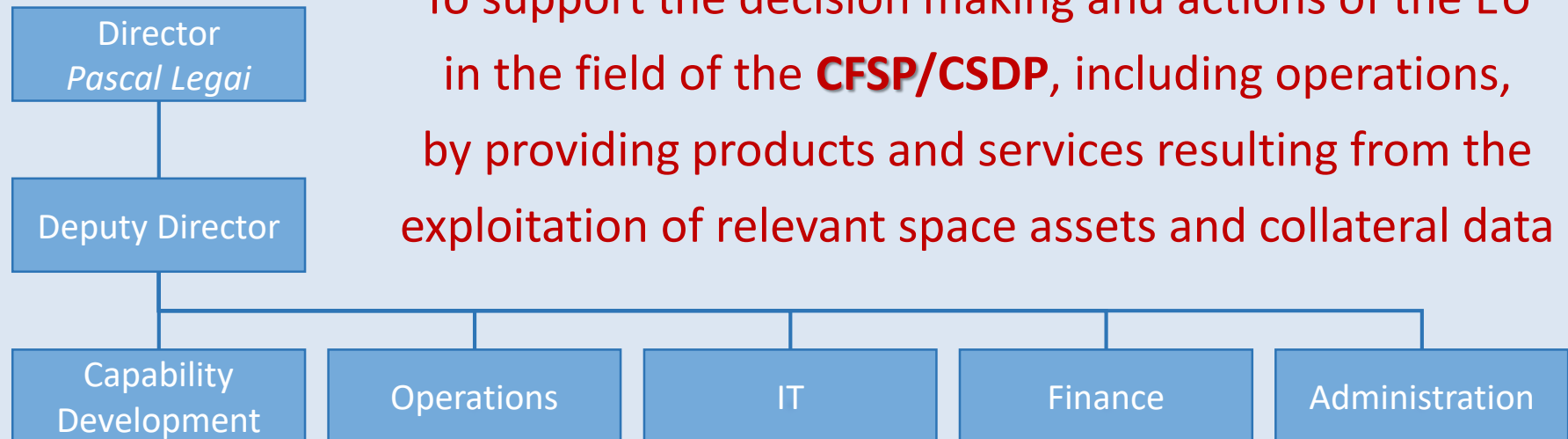
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European Union Satellite Centre (SatCen)

Dedicated individuals: Team spirit, commitment, proactivity and excellence

- Agency of the EU Council
- HQ in Torrejón de Ardoz (ES)
- EO Satellite Data – secure context
- Geoint Service Provider, 24/7 availability



Main Analysis Domains



Security Surveillance

- *Treaty verification*
- *Border control*
- *Global terrorism*
- *Piracy and coastal analysis*



Contingency Planning

- *Support to evacuation operations*
- *Rapid mapping*



Humanitarian Aid

- *Refugee camps / IDPs*
- *State failure and insurgency*
- *Man-made and natural disasters*



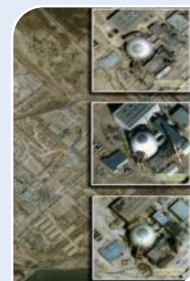
Critical Infrastructure

- *Elements-at-risk mapping*
- *Threat analysis and Vulnerability Assessment*



Military Capabilities

- *Analysis of military activity / deployed forces*
- *Battle Damage Assessment*



Weapons of Mass Destruction

- *Arms control and non-proliferation*
- *Chemical weapons*

EU SatCen and Big Data

- ***Operations***
- ***Regional Conflicts***
- ***Piracy - smuggling***
- ***Migration***
- ***Proliferation WMD***
- ***Disasters humanitarian aid***



Implementing the EU Global Strategy

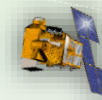
Sensors

EU Sensors

Governmental



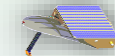
Hélios II



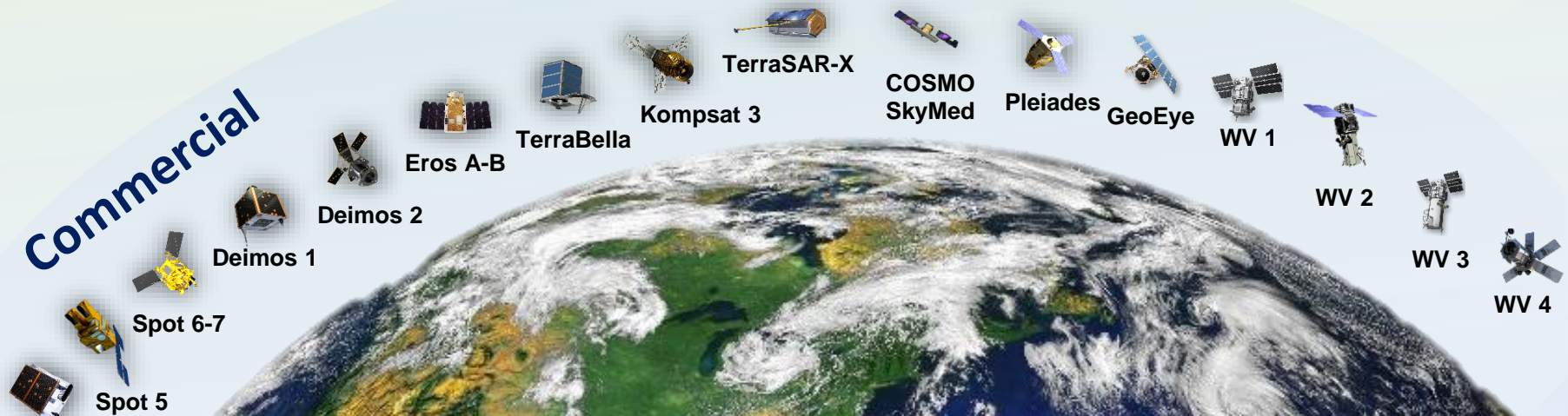
COSMO
SkyMed



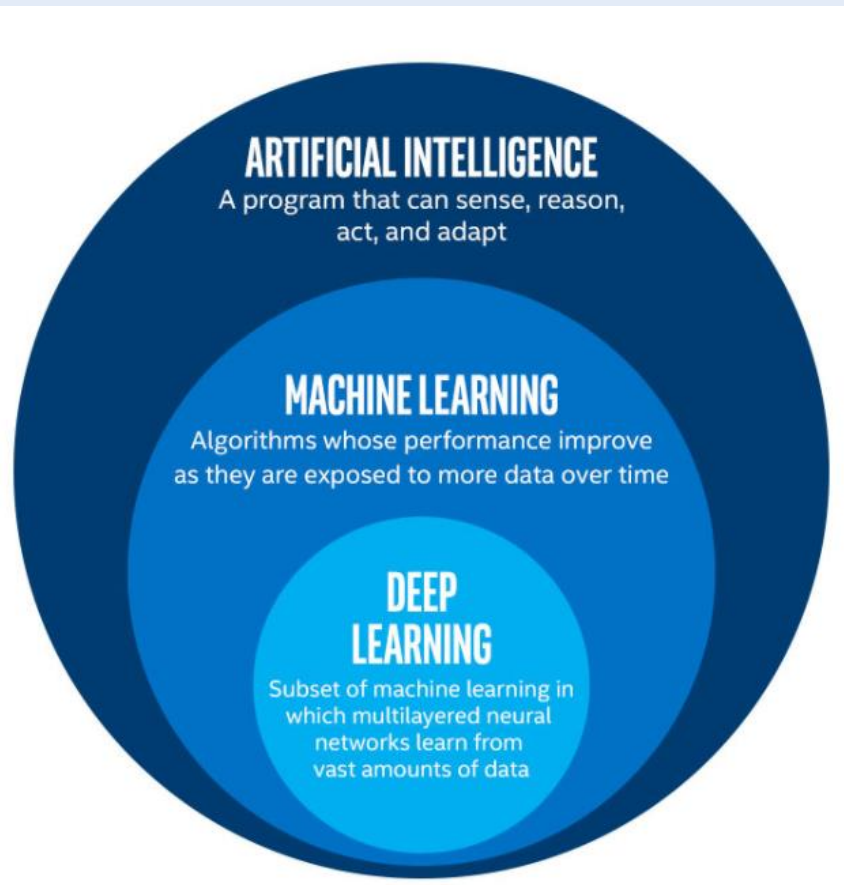
SARLupe



Commercial



Huge amount of data: An OPPORTUNITY!



Not programming computers anymore but showing them examples

- Large quantities of examples
- High computation performances necessary

Machine learning is based on mathematics, probabilities and statistics.

2 flavors:

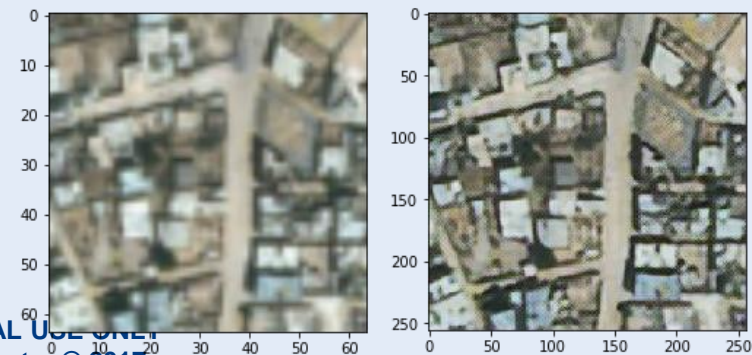
- **supervised** (you know what your samples mean), applications: classification, detection, regression
- **unsupervised** (you want to make sense of the meaning of your samples), applications: clustering, anomaly detections

Define an approximation function between inputs

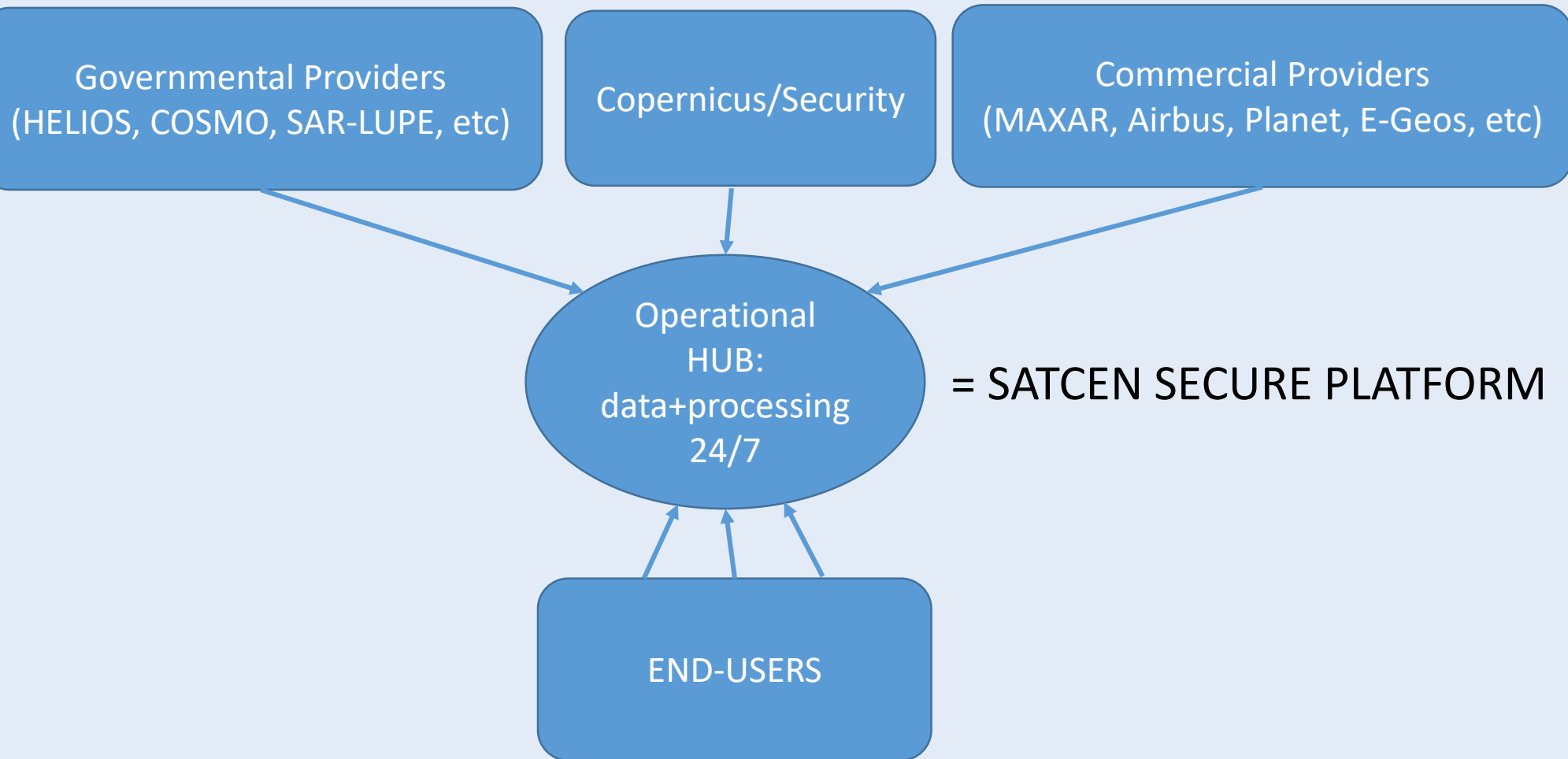
and expected outputs **by learning parameters through large datasets**

Artificial Intelligence in SatCen

- **Computer vision:** detection of objects from Satellite Imagery, from internet imagery, face detection and identification, extraction of roads, buildings, change detection, land use extraction
- **Natural language processing:** identification of topics from social media, clustering of data, assisted editing of analysis,
- **Cybersecurity:** anomaly detection on web portals usage, clustering of servers
- **Predictive models** on ships movement, refugee etc.



Secure platform approach



To take away

- **From** « tasking on a specific area + data collection + analyse »
- **To** « automatically process constantly update data bases over geographic areas and/or objects of interest in order to extract ALL relevant, reliable and timely information for the preparation of in-depth analytical products and services »

From REACTIVE to PROACTIVE mode



**Thank you for
your attention!**