The Rise of AI for EO

AI4Copernicus – Namur, 17 Sep 2019

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Earth Macroscope

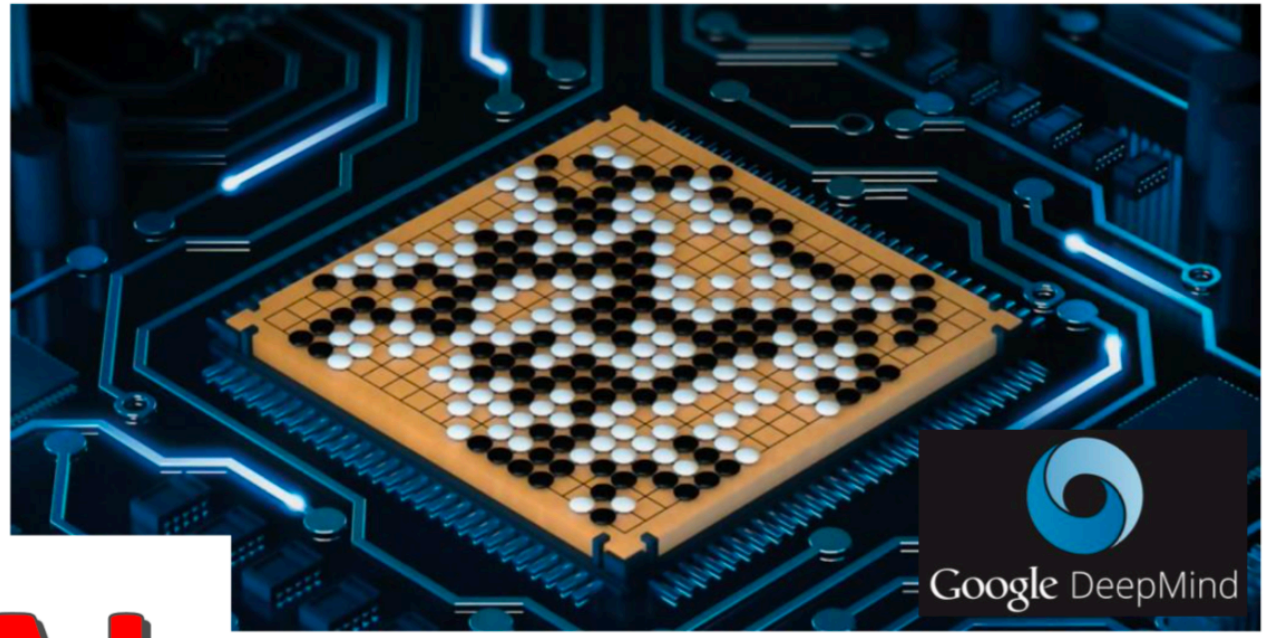
ESA Earth Observation

Taking the Pulse of our Planet

ESA UNCLASSIFIED – For Official Use

EO Today
esa
msg
metop
mtg-i
metop-sg-b
smos
cryosat
swarm
aeolus
earthcare
biomass
flex
goce
sentinel-1
sentinel-2
sentinel-3
mtg-s
sentinel-4
metop-sg
sentinel-5
sentinel-5p
sentinel-6
ESA UNCLASSIFIED – For Official Use
European Space Agency

Courtesy: F. Heintz

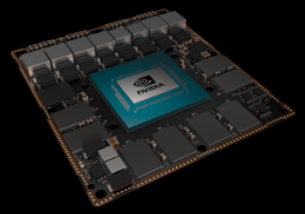


AI

The new Electricity

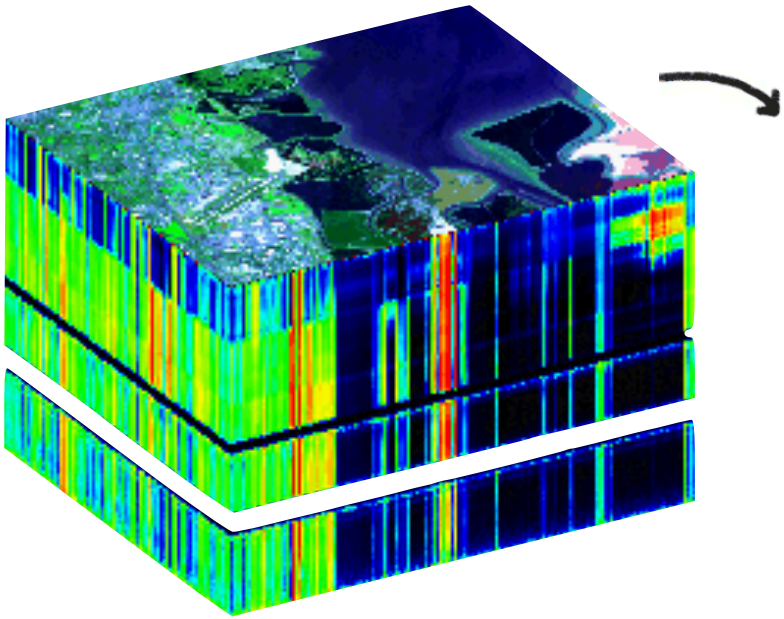
Why now? Big Data * Big Computing * Open Soft

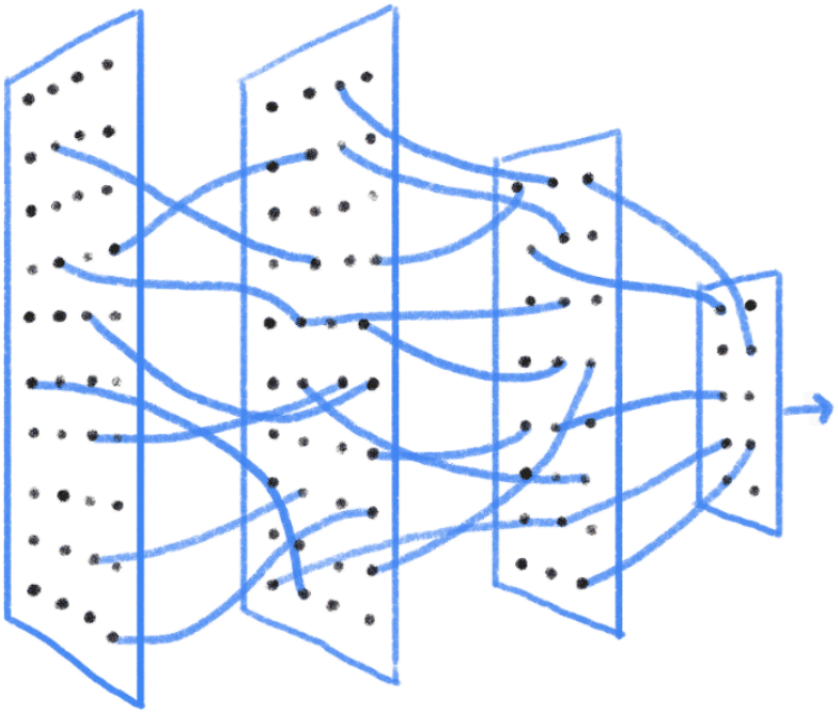
X



Issue of CONNECTIVITY

Computer Vision for EO





Feature Detection
Classification

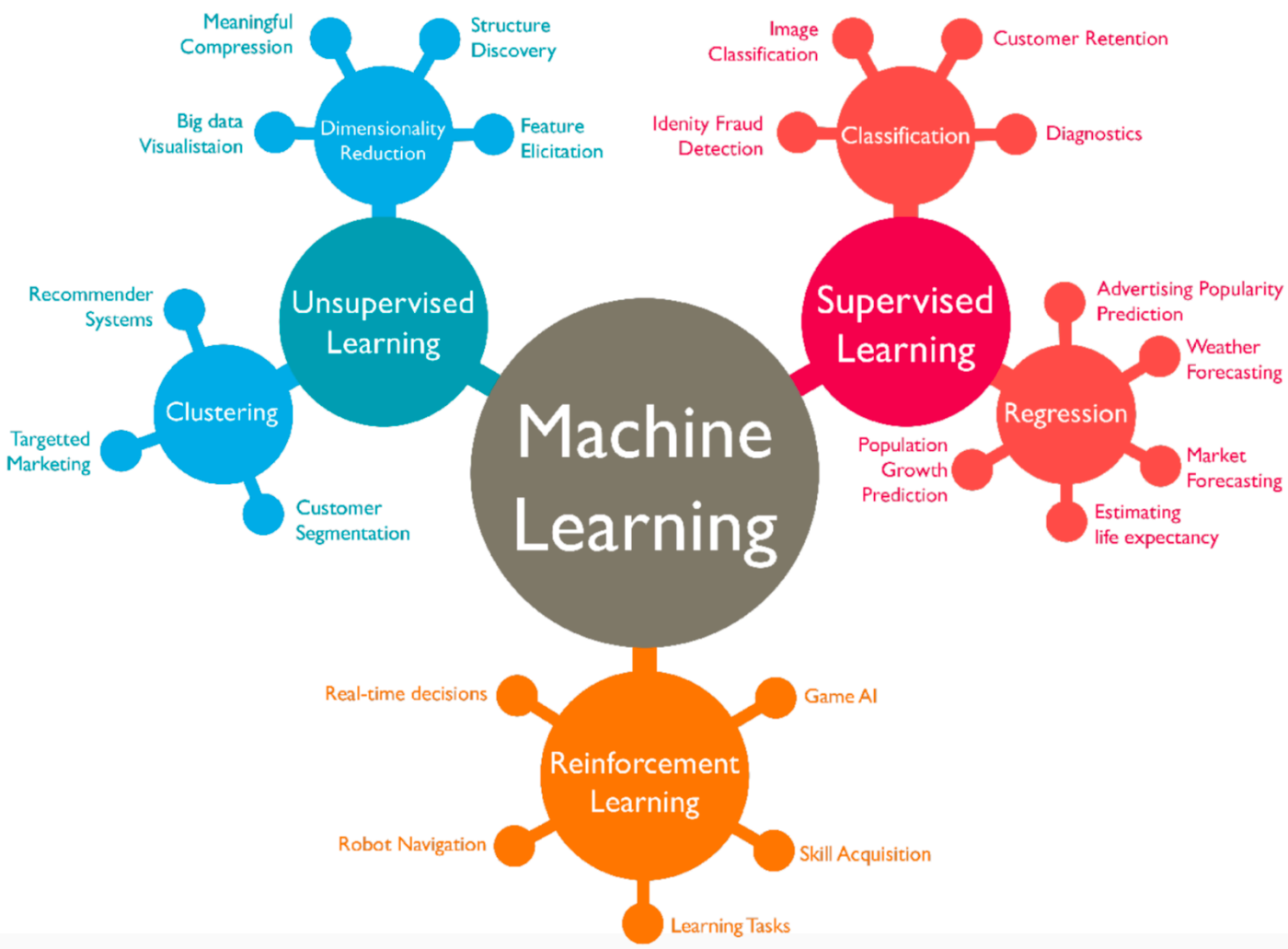
- Crops
- Oil Palm
- Ships
- …

Open Software

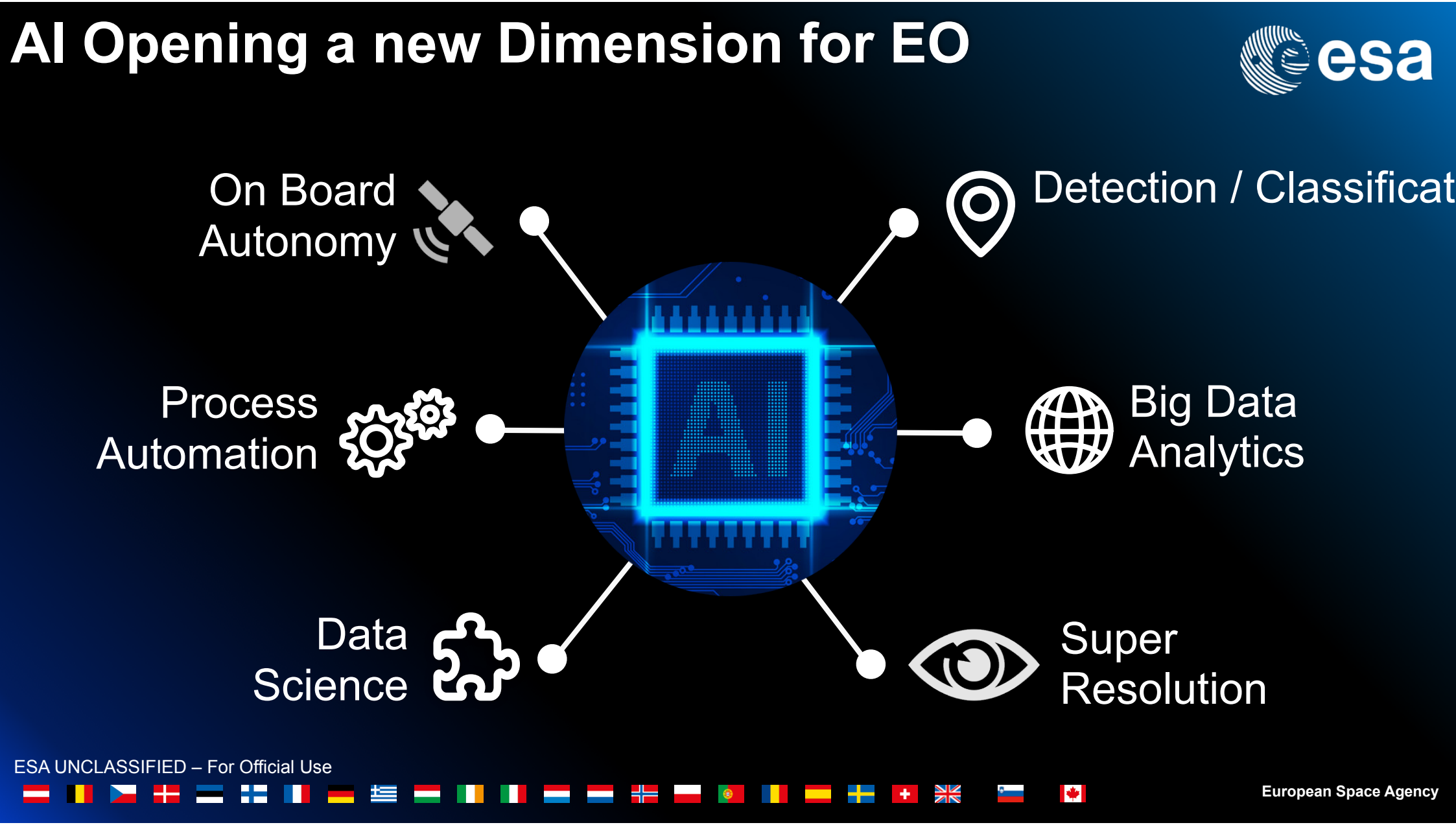
Need for a mixed Approach

*"All models are **wrong** but some are **useful**."*

George Box (1976)



AI Opening a new Dimension for EO



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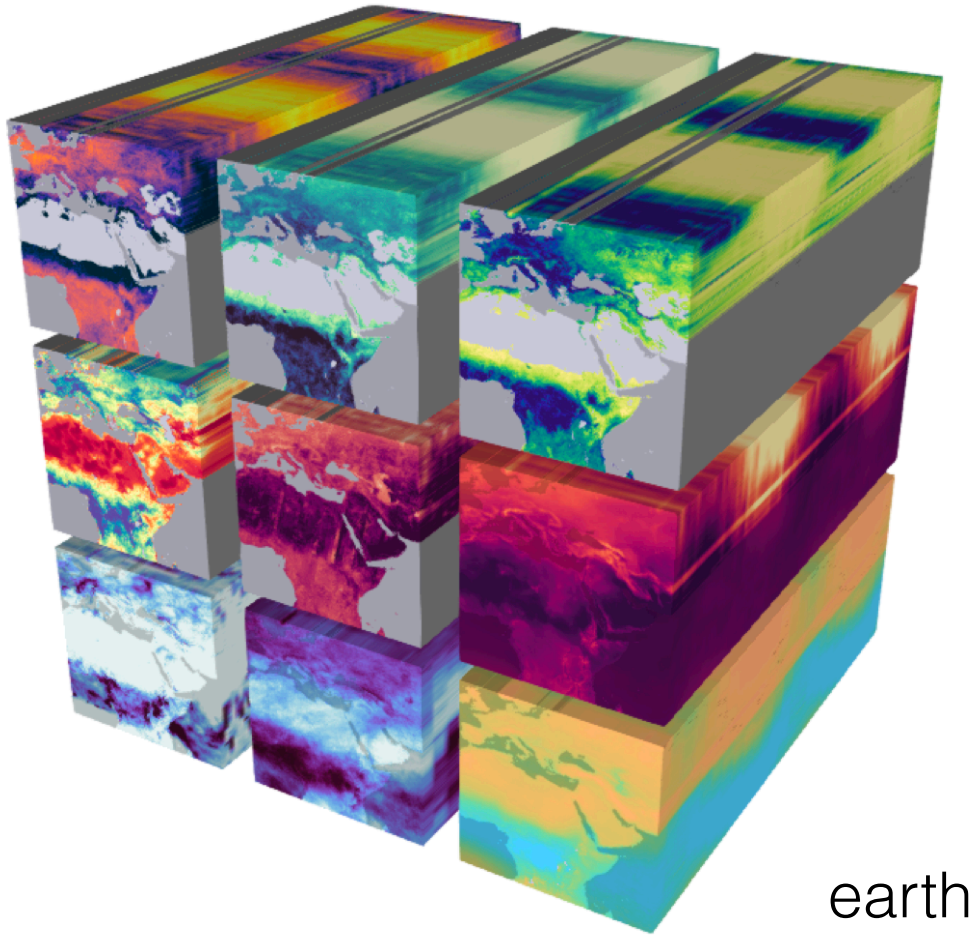
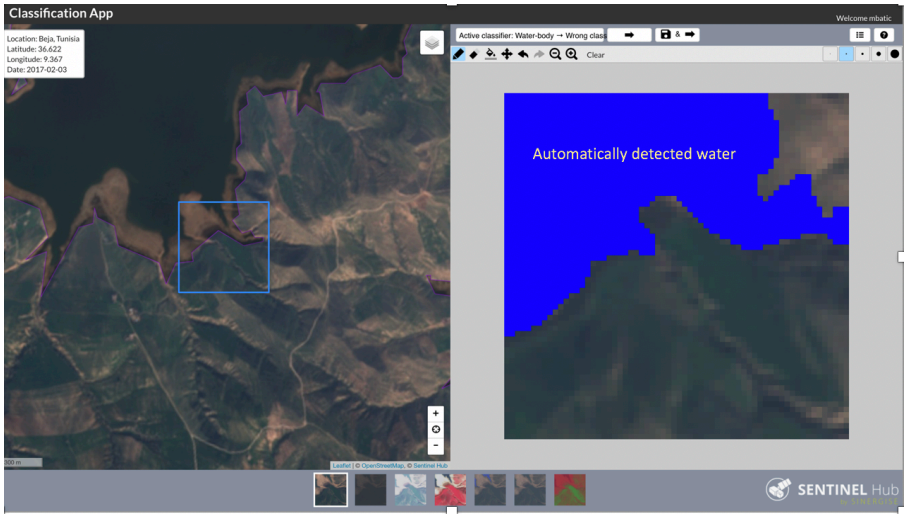
Earth in a Box - Earth System Data Lab - Ready Data Sets



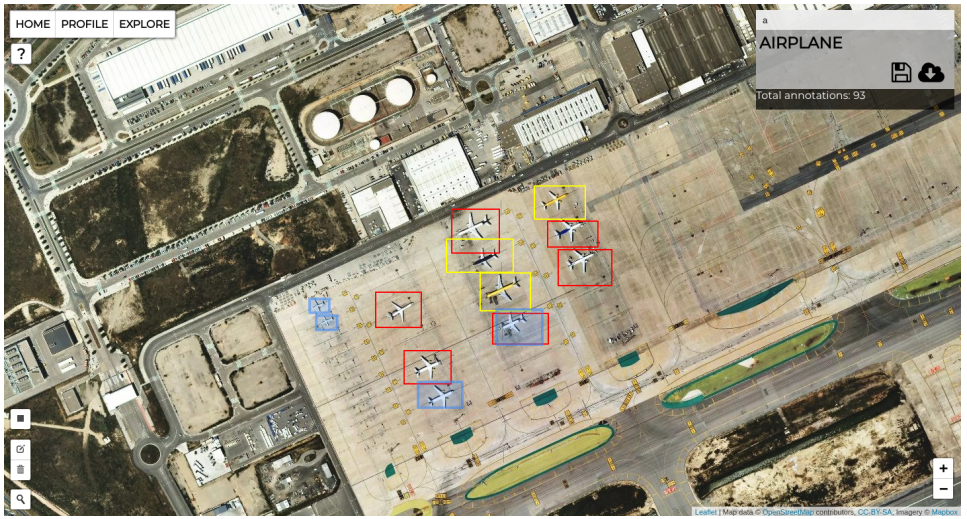
earthsystemdatalab.net

AI Analysis Ready Data Set

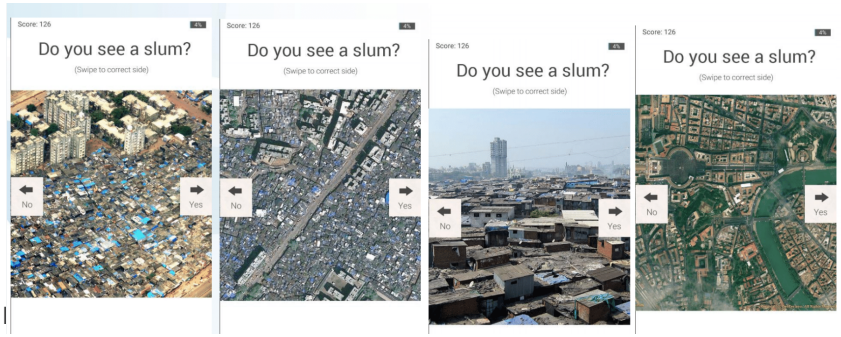
S-2 Annotation - Query Planet



VHR Annotation - PointEO



Urban Annotation - Game.EO

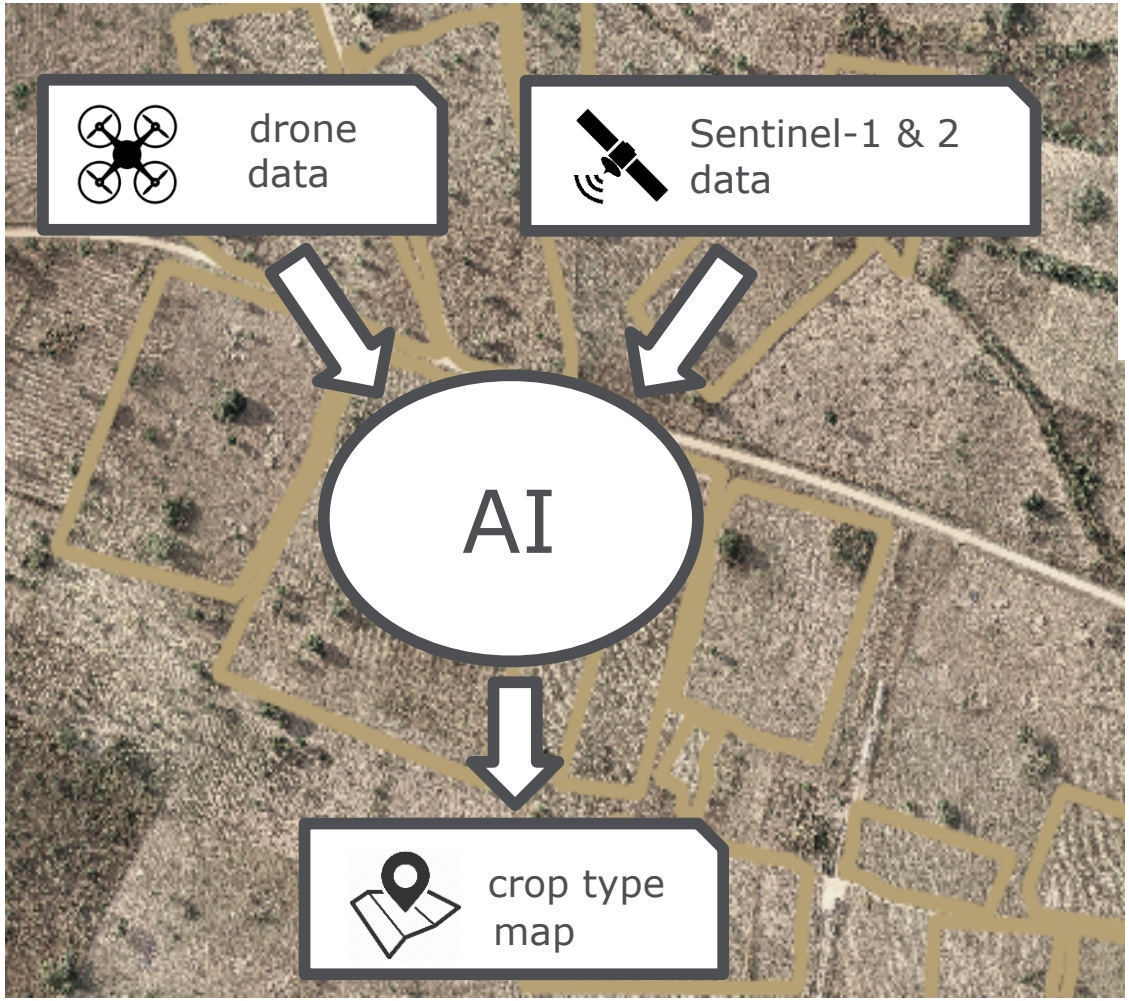


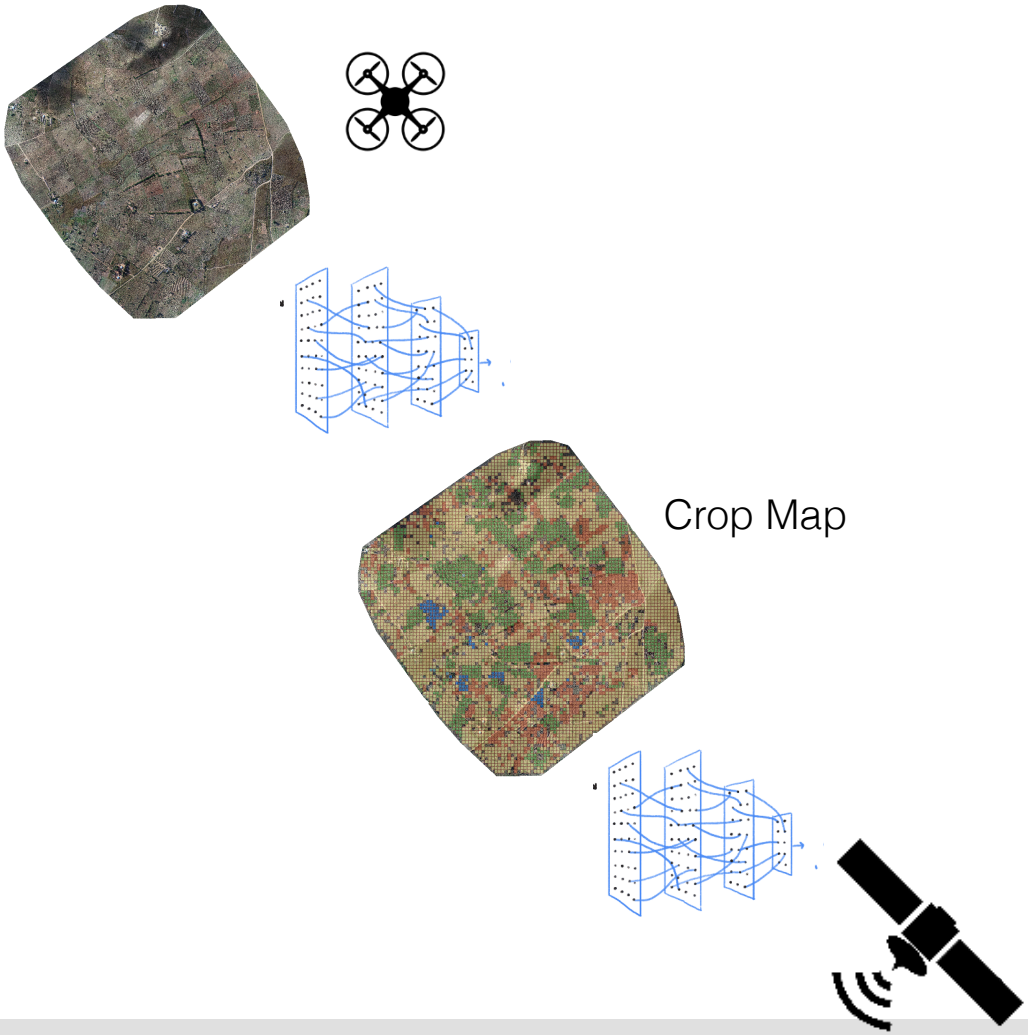
https://eo-learn.readthedocs.io/en/latest/

bigearth.net
openstreetmap.org
osmhome.org

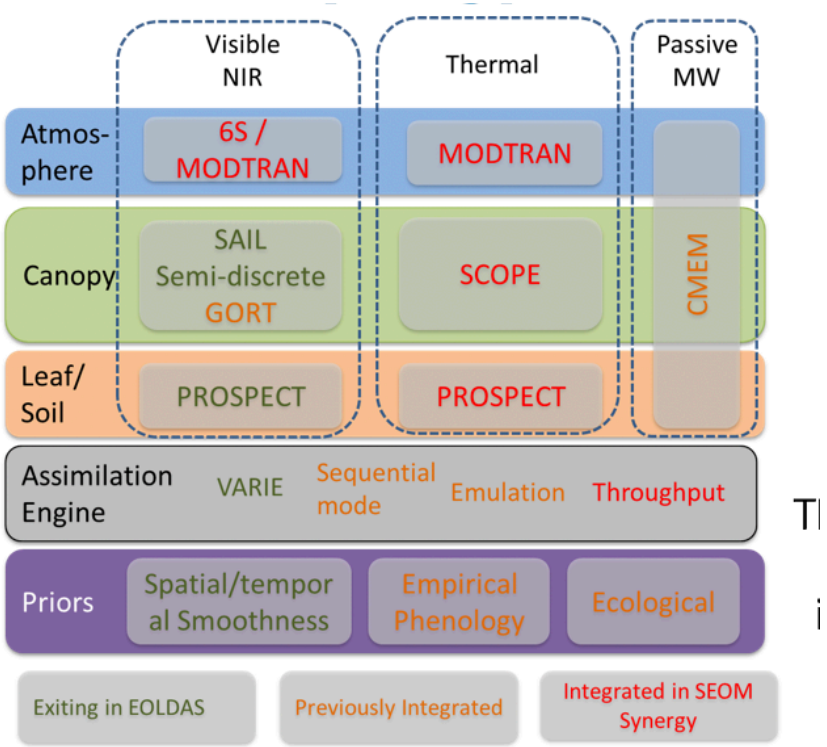
Query Planet

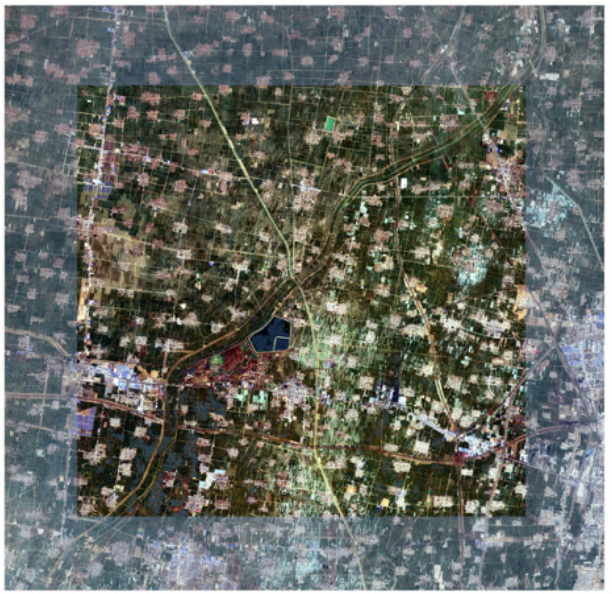
Sprint Programme with UNICEF:
Identifying crop type mapping in Malawi





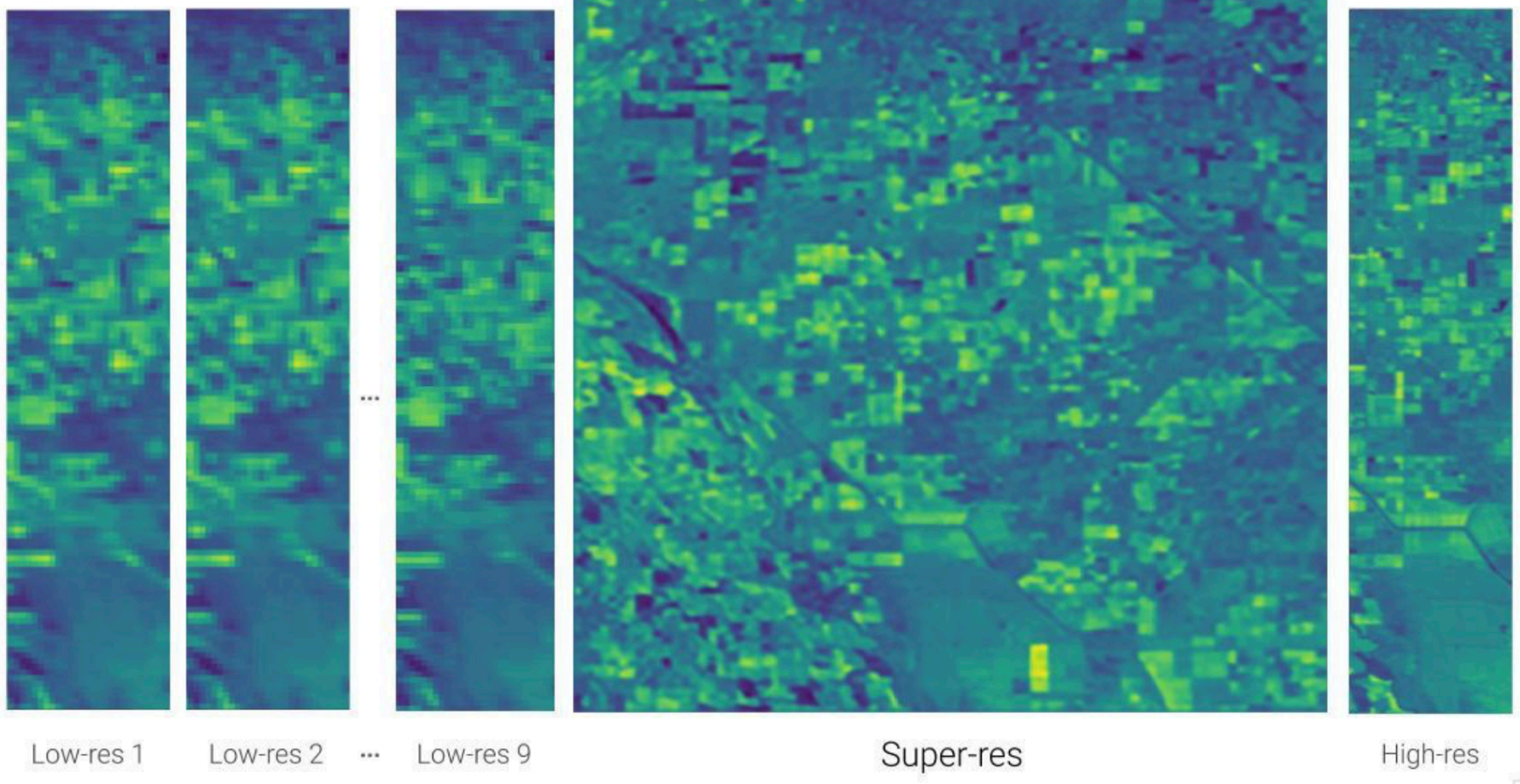
Physics Aware AI





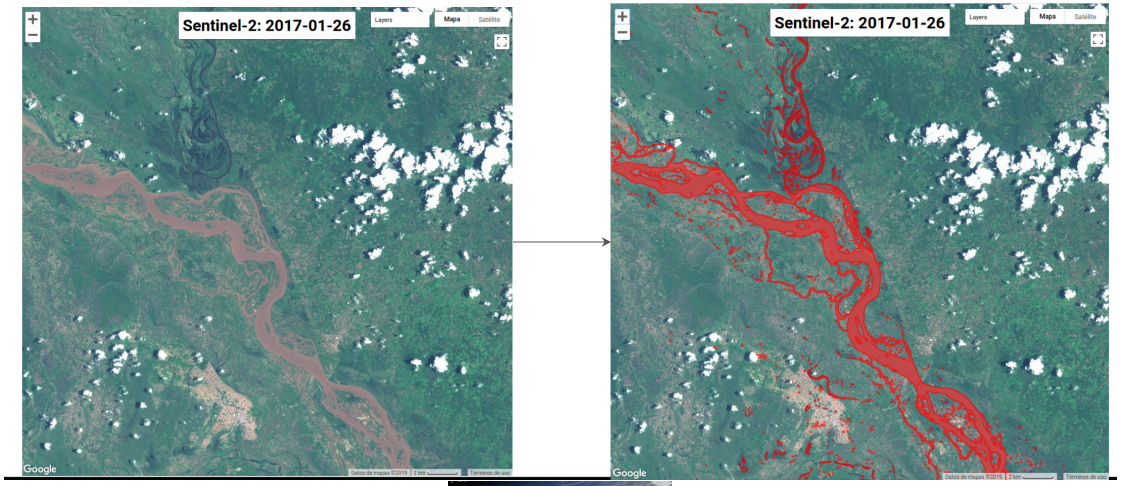
Atmospheric correction (centre part) of Sentinel-2 data over China with very high aerosol loading

Super Resolution

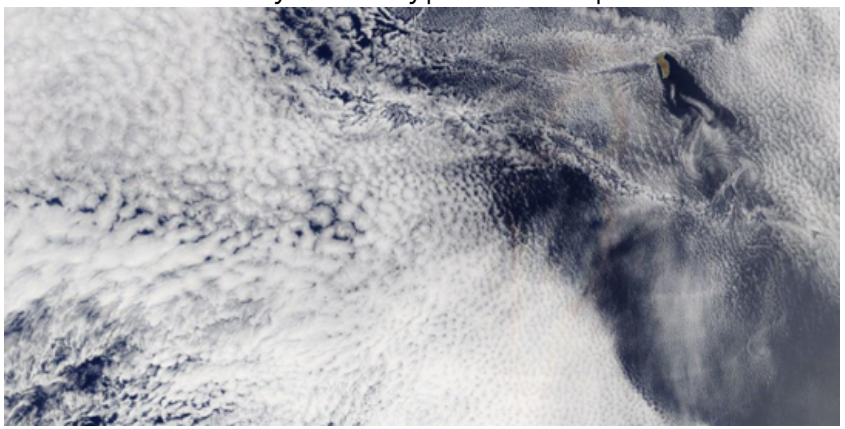


Kelving platform, DeepSUM, Super-res: https://bit.ly/2kNR8Sr

Flood extent/Water segmentation (optical)

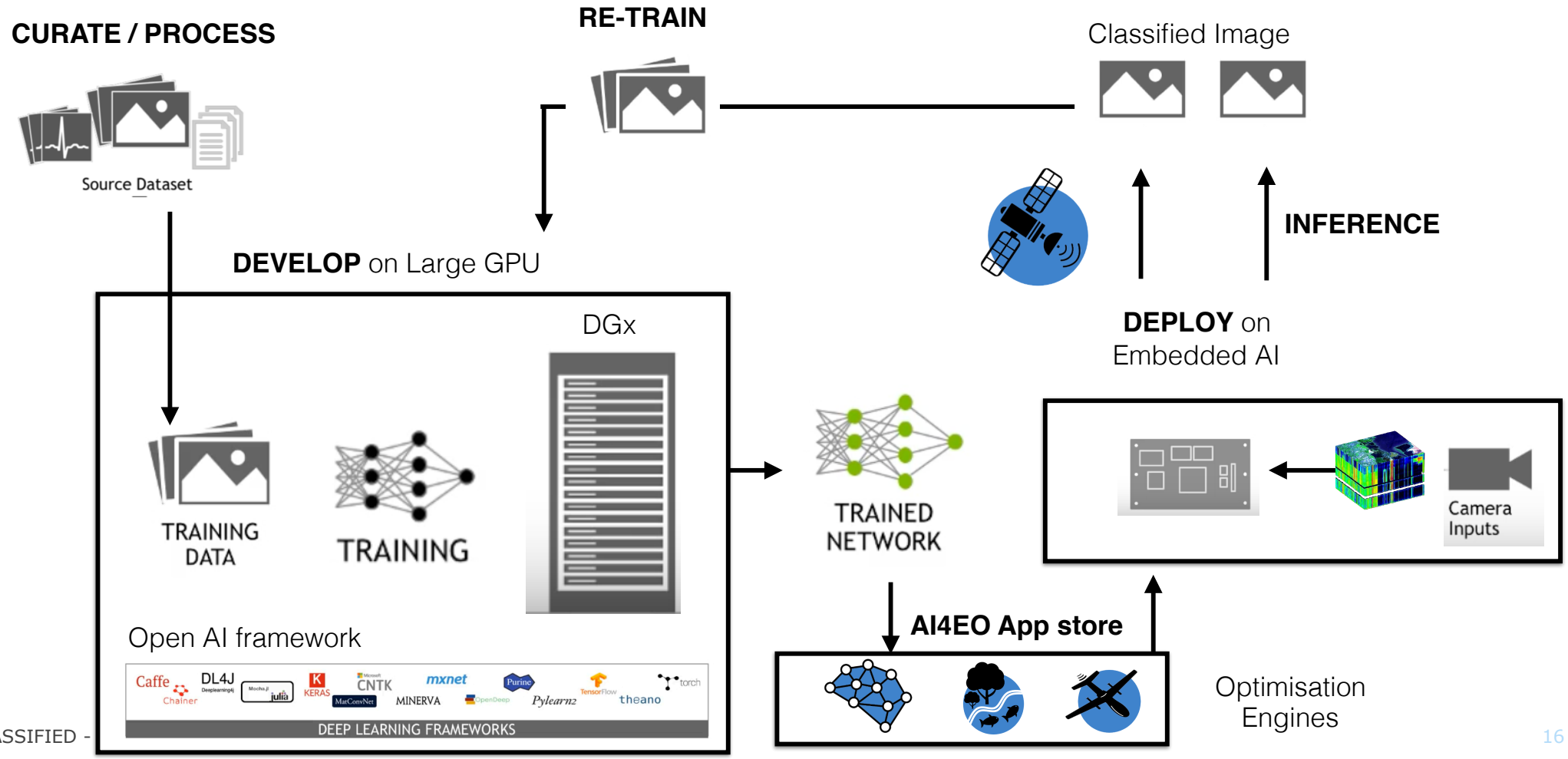


How many cloud types in this picture?



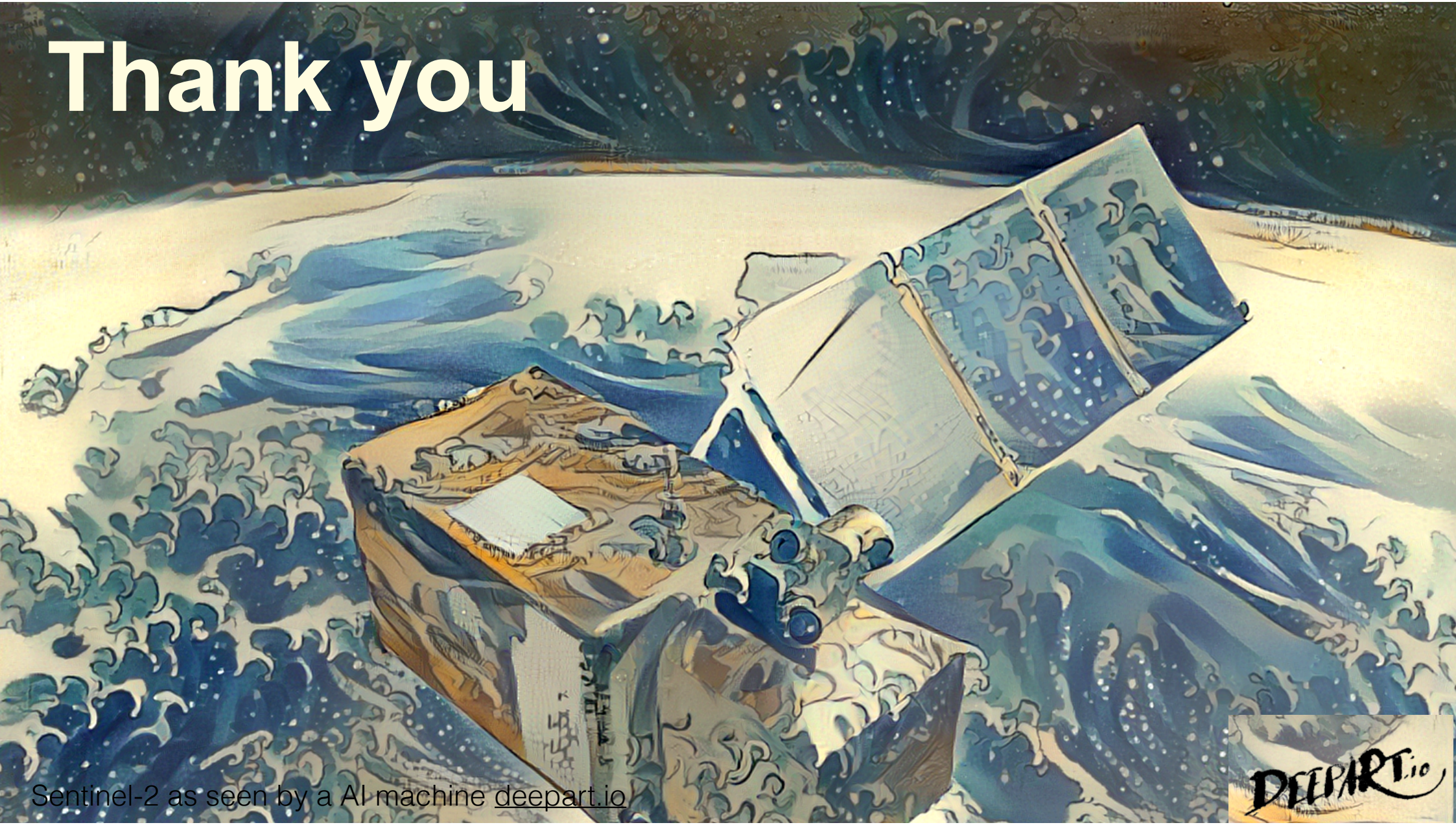
https://fdleurope.org

Adaptative Learning



AI accelerates **Time to Insight** for Copernicus

Thank you



Sentinel-2 as seen by a AI machine deepart.io

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