Reinforcing the AI4EU Platform by Advancing
Earth Observation Intelligence, Innovation & Adoption

Responsible AI perspectives for AI and Earth Observation (EO)

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Why AI matters for EO ?

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Most satellite images will never be seen by human eyes, as there are not enough humans on Earth !

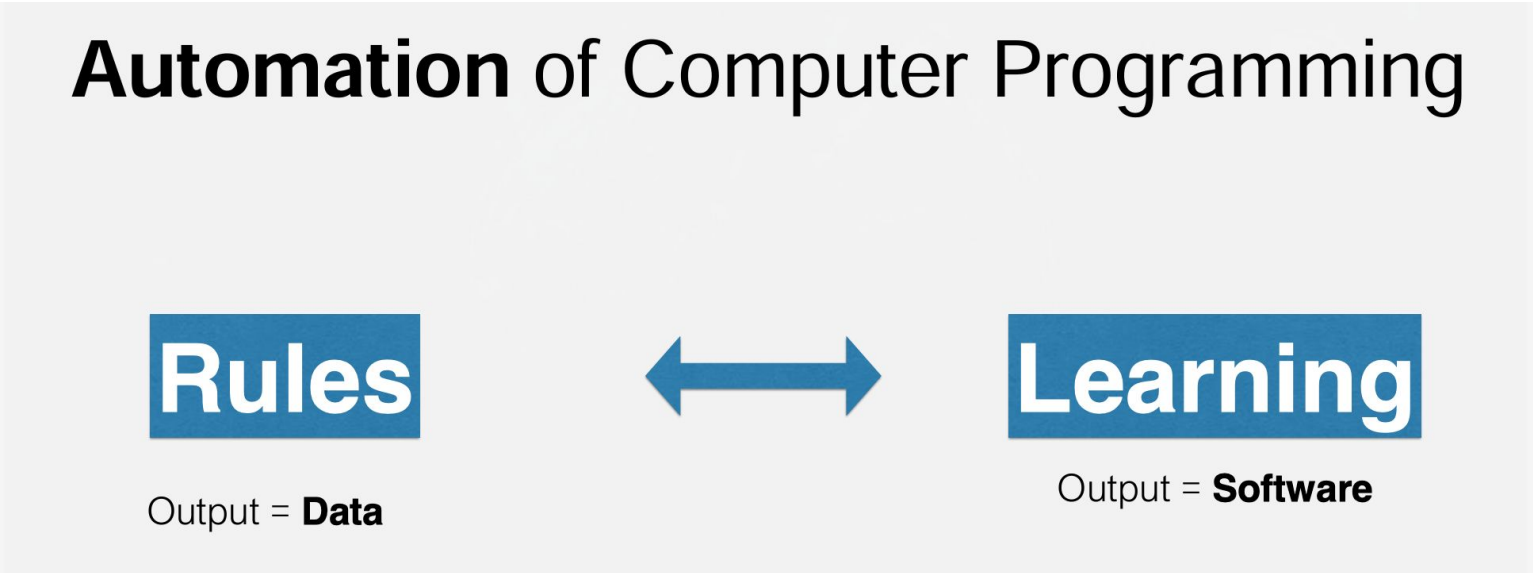
Therefore AI (Artificial Intelligence) and ML (Machine Learning) can ‘help’ by:

- reducing the cognitive load of repetitive cognitive tasks linked with EO
- overcoming data complexities associated with big EO data
- enhancing the capabilities of EO experts and manifest a real data revolution

AI can benefit Copernicus and Copernicus can benefit AI

Why AI matters for EO?

“AI = Software 2.0”
(Pierre Philippe, ESA)

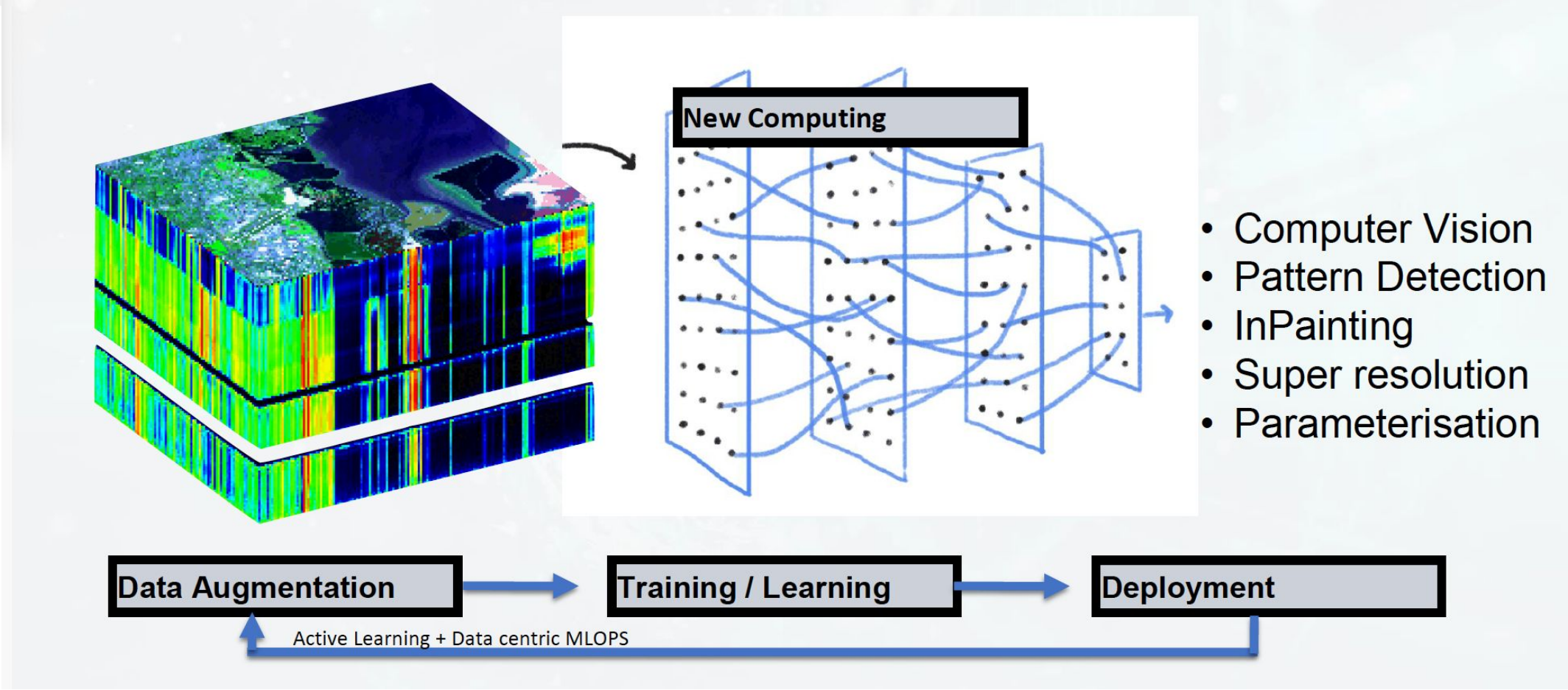


Source: Pierre Philippe (ESA, Φ-lab team, 2023)

AI provides new tools to make sense of big data in an automatic and scalable way, enabling us to:

- solve global challenges in Earth Sciences
- create new AI-driven business applications
- provide real world impact by addressing emerging societal challenges

Why AI matters for EO?



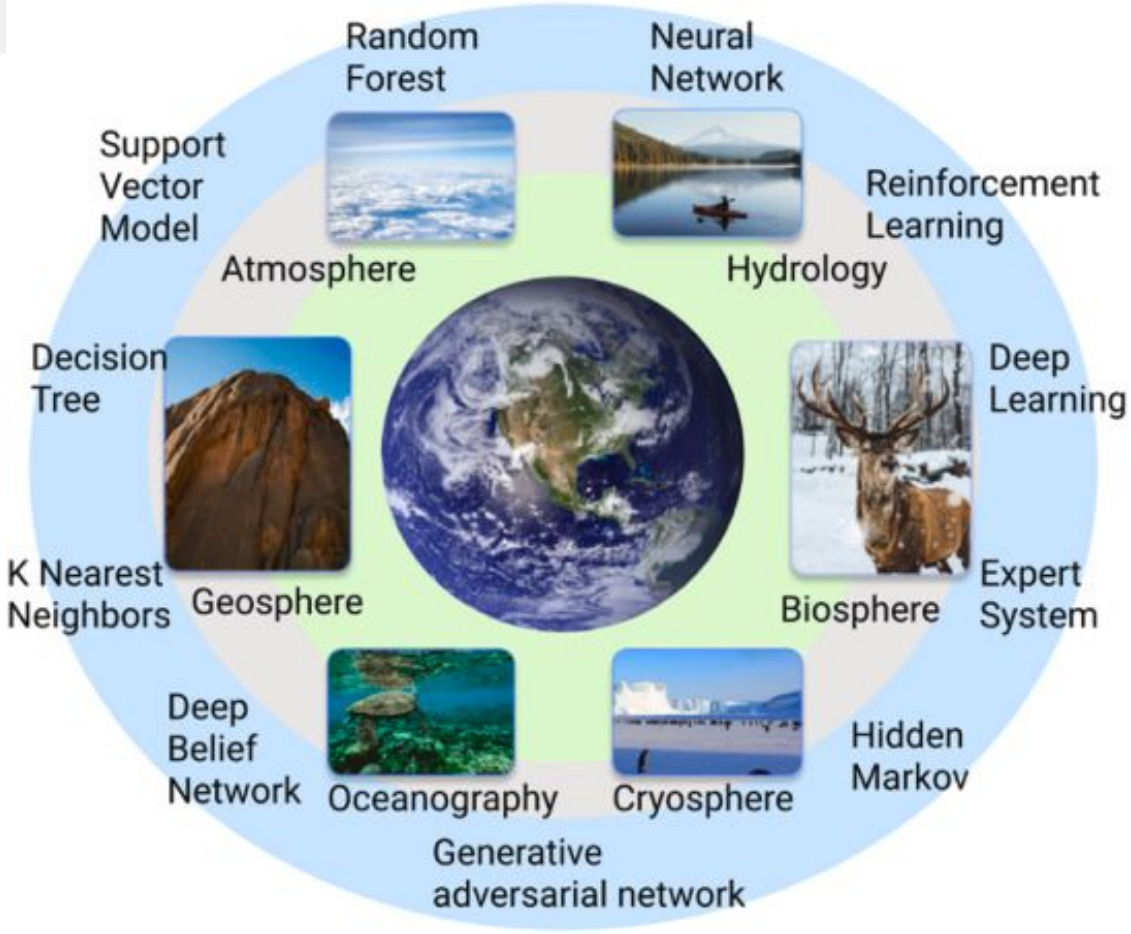
Source: Pierre Philippe (ESA, Φ-lab team, 2023)

AI matters for EO !

In recent years, Earth Sciences urgently need for innovation on (Sun, 2022):

- improving accuracy,
- enhancing model intelligence level,
- scaling up operation, and
- reducing costs in many subdomains amid the exponentially accumulated datasets

AI models have outperformed conventional data handling in many cases (i.e., recognizing street views, extracting roads, etc) & computing limitations have diminished so AI has accelerated scientific and industrial advances and discoveries across numerous industrial domains (medicine, biology, etc).



Earth AI overview - Geoscientists led the development of tools bridging gaps between geoscientific data and AI models

Source: Sun, Z., Sandoval, L., Crystal-Ornelas, R., Mousavi, S. M., Wang, J., Lin, C., ... & John, A. (2022). A review of earth artificial intelligence. Computers & Geosciences, 159, 105034.

Overview of the AI & Earth Observation Market & Trends

The AI & EO ecosystem

The AI & EO Ecosystem

The AI & EO ecosystem is broad !

Source: AI4EO (ESA Φ-lab)

AI & EO Initiatives

- https://destination-earth.eu/ an ambitious initiative of the European Union to create a digital twin – an interactive computer simulation – of our planet.
- https://ai4eo.eu/ an initiative of ESA Φ-lab dedicated to organising cutting-edge AI-based challenges. These challenges not only promote the growth and engagement of the AI4EO community, but also provide a platform for researchers and coders to showcase their work and make a tangible impact in solving some of society's most pressing challenges.
- https://deepcube-h2020.eu/ aims to unlock the potential of big Copernicus data with AI and Semantic Web technologies, with the objective to address problems of high environmental and societal impact.
- https://www.eo4eu.eu/ the EO4EU platform aims to make EO data more accessible than ever by providing an AI-augmented ecosystem with improved user interfaces for EO services and data.
- https://ai4copernicus-project.eu/ aims to bridge AI with EO world by making the AI-on-demand platform, the digital environment of choice for users of Copernicus data, for researchers and innovators.
-

DEEP CUBE

EO4EU
Earth Observation Data & Service Accessibility

AI4 copernicus

AI & EO Initiatives & EU AI Networks of Excellence

- **ESA-CLAIRE Special Interest Group**- CLAIRE (Confederation of Laboratories for Artificial Intelligence Research in Europe) - A Special interest group ESA-CLAIRE has been officially launched at LPS 2019 in Milan.

- **ELLIS Programme on Machine Learning for Earth and Climate Sciences** – European Lab for Learning and Intelligent Systems (ELLIS) - top European academics in close cooperation with industrial researchers; dedicated Programme on Machine Learning for Earth and Climate Sciences.

How to kick-start your own company ?

Advice from the AI4Copernicus start-ups ….

“Product and user is king ! Always question development standard practices, keep products simple for the user, delete unnecessary features and always innovate :)”

Anonymous, AI4Copernicus project beneficiary