



Introducing White paper for AI/ML outline.

October 6, 2022

WGISS/Technology Exploration I.G.

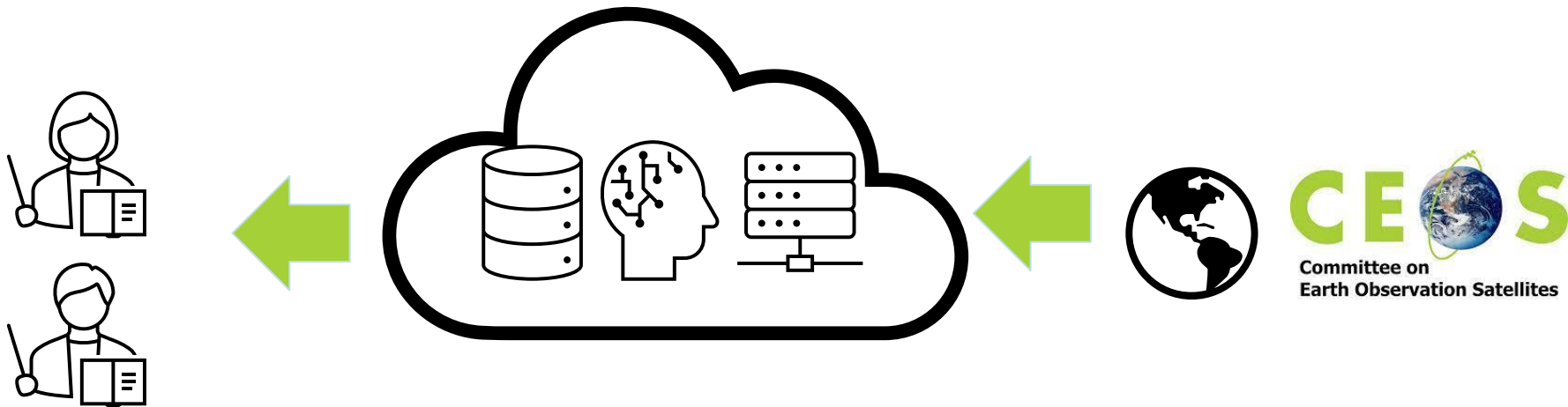
Background and Scope



- This white paper shows a use case about Deep Learning (DL), Machine Learning (ML) and Artificial Intelligence (AI), which uses EO data.
- Some CEOS agencies provide DL/ML/AI data and platforms and introduce them at WGISS meetings.
- But there aren't any summarized documents.
- This document can lead data users to data and platforms.
- Additionally, data providers can know where to upload or what cloud is proven for DL/ML/AI dataset.

Who and Why

- Who will benefit from a White paper
 - Data User
 - Student majoring in remote sensing
 - Data Scientist who isn't majoring in remote sensing
 - Data Provider
 - Agency who plans to provide dataset for AI/ML newly.



Contents



1. Introduction
2. Basis of AI/ML for earth observation domain.
3. Introduce AI/ML use case in CEOS.
4. Share platforms and data
5. Notice the difference between common AI/ML and EO's one.

1.Introduction



- To explain purpose of white paper.

- Before AI/ML era.
 - Model based analysis.
 - Only focused/processed a part of data.
 - Event analysis
 - area/time of interest
 - huge resources are needed for processing so most data are frozen.
- Towards AI/ML
 - Learning based analysis.
 - Expand to untouched observed data by using analyzed one.
 - Simplify data analysis like image processing.

- Categorize AI/ML application.
 - Image processing
 - Image detection
 - Segmentation
 - Recognition
 - Classification
 - Estimation
 - Upscale
- Those techniques can rediscover EO data value.
 - User can access data much easier.
 - After image processing, we can add “label” to metadata.
 - User can understand intuitively.
 - Bridge the gap remote sensing to other study(including data science).

Use case in CEOS/WGISS



- Show experimental use case.
 - UK/PML
 - ESIP
 - NASA ESDSWG Task 4
 - ML training data and NASA Earthdata Cloud
 - NOAA

Refers from past WGISS.
Adds by volunteers including Tech. EXPO.

Platforms and data



- Show/List platforms and data for AI.
 - This table summarizes experimental use cases by platform, data, and policy.

	Platform	Data	Policy
PML			
ESIP			
NASA			
NOAA			
(Example)JAXA	AIST	ALOS-2	Closed access

Perceived problems



- difference between “standard ML” and “ML for EO”.
- difficulty in ground truth data, training data, models.
- Efficient access to agency data - NASA

Time line

