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VTT

Self-supervised Deep Learning in Earth Observation based Forest Inventory

ESA RepreSent & ESA F-TEP workshop
4 May 2023

Matthieu Molinier, Oleg Antropov, VTT, **Octavian Dumitru**, DLR

esa ESA RepreSent DLR EPFL VTT e-geos AN ASI / TELESPAZIO COMPANY

Practicalities

For participants (100+ people registered)

- webcams and microphones are deactivated. The workshop is not recorded.
- please use the **Q&A tab on top of Teams interface** to ask questions
- we will go through them during Q&A sessions or offline after the workshop (follow-up email)

For presenters

- share your screen when we introduce you
- please **turn on your webcam when you present**, and off when we switch to the next presenter
- 1mn signal (the host turns on webcam), then tells you when it is time to conclude (30 s)
- **please check Q&A after your presentation**, write a reply to unanswered questions if you can

Self-supervised Deep Learning in Earth Observation based Forest Inventory
Workshop - ESA RepreSent project & ESA Forestry Thematic Exploitation Platform (F-TEP)
4 May 2023

Agenda

10:00 am (EEST)	Welcome and ESA RepreSent project introduction	Matthieu Molinier, Oleg Antropov, VTT, Corneliu Octavian Dumitru, DLR
10:05	Forest inventory using EO data	Jukka Miettinen, Oleg Antropov, Tuomas Häme, VTT
10:15	Self-supervised learning in Earth Observation	Devis Tuia, EPFL
10:25 10min + 5min Q&A	MoCo & MAML models in forest mapping using Copernicus Sentinel-2 and Sentinel-1 data	Lloyd Hughes, Marc Russwurm, Devis Tuia, EPFL
10:40 10min +5 min Q&A	UNet+ models with multi-source EO data for forest inventory	Oleg Antropov, VTT
10:55 10 min +5 min Q&A	DCVA approaches for forest change detection using Copernicus Sentinel images	Ridvan Kuzu, DLR, Oleg Antropov, VTT
11:10	Break (5 min)	
11:15 20 min +5 min Q&A	F-TEP introduction and tools overview	Jukka Miettinen, Renne Tergujeff, VTT
11:40 20 min + 5 min Q&A	F-TEP service demonstrations using self- and weakly supervised learning	Lauri Seitsonen, VTT
12:05	F-TEP developer's perspective	Lauri Seitsonen, VTT
12:15	Concluding remarks	Oleg Antropov, Matthieu Molinier, VTT

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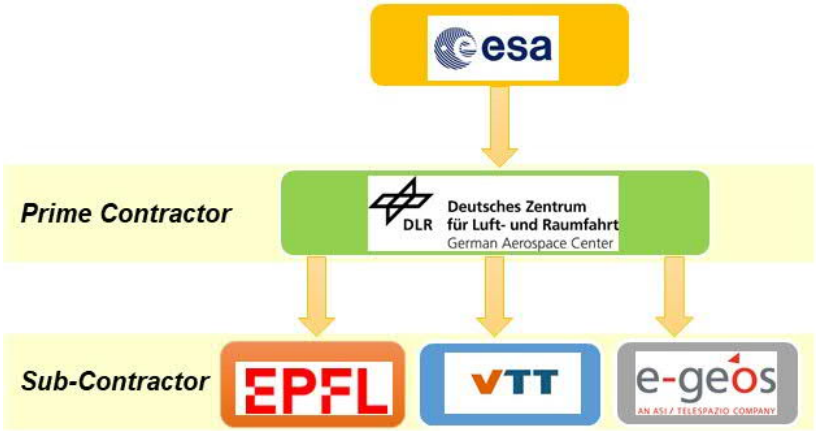
About ESA RepreSent project – Octavian Dumitru, DLR

Project title:	***RepreSent* - Non-supervised representation learning for Sentinels**
ESA ITT:	ESA AO/1-10552/21/I-DT AI4EO CHALLENGES – NON-SUPERVISED LEARNING
Project duration:	12 months
Final presentation	ESA ESRIN, Frascati, Italy - **May 11th 2023**
Prime-contractor:	DLR - Germany
Sub-contractors:	EPFL - Switzerland, VTT - Finland, e-GEOS - Italy
Budget:	499,085 €

Link to ESA RepreSent project page : https://eo4society.esa.int/projects/represent/

Consortium as a whole



DLR

- Experience in leading national and international projects
- Methodology: **self-supervised patch clustering**, **change detection**, multi-temporal segmentation
- Leadership of promotion and communication within its wide AI4EO network

VTT

- Leader of three use cases (UCs): **forest disturbance monitoring ; forest biomass estimation ;** cloud detection and removal
- Methodology: providing **baseline non-supervised methods** and **collaboration to novel methods**
- Network of users in the forest domain

EPFL

- Methodology: **self-supervised contrastive learning**, **deep clustering approaches** and **meta-learning**
- Promotion and communication tasks

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- Leader of two UCs: improving the quality and efficiency of automated land cover mapping and anomaly detection in long time series of PS-P InSAR terrain displacement measurements
- Methodology: self-supervised graph neural networks for time-series anomaly detection
- Wide network of users

DLR

DLR EPFL

RepreSent project

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Thank you!

DLR