



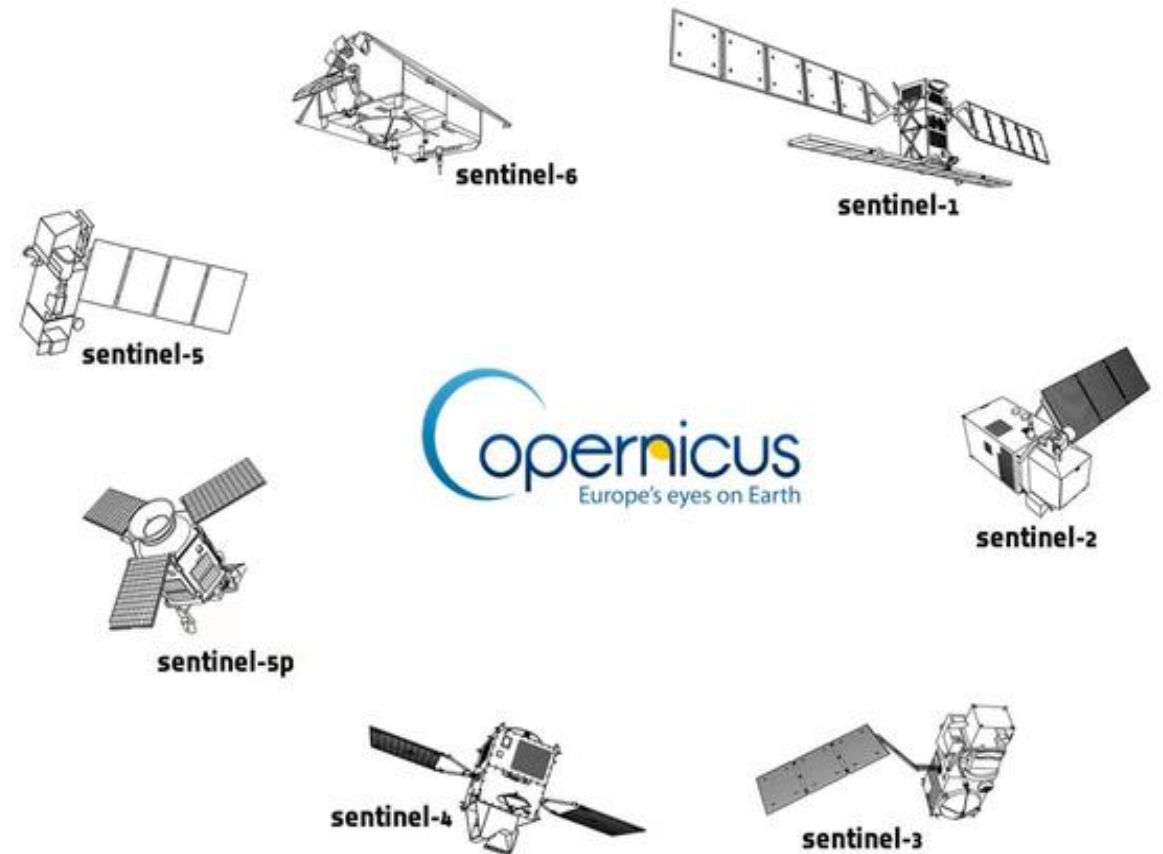
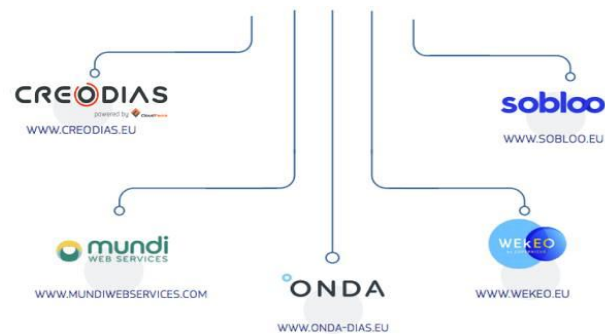
Reinforcing the AI4EU Platform by Advancing
Earth Observation Intelligence, Innovation & Adoption

The AI4Copernicus Project Overview

Antonis Troumpoukis, NCSR-Demokritos

The Copernicus programme

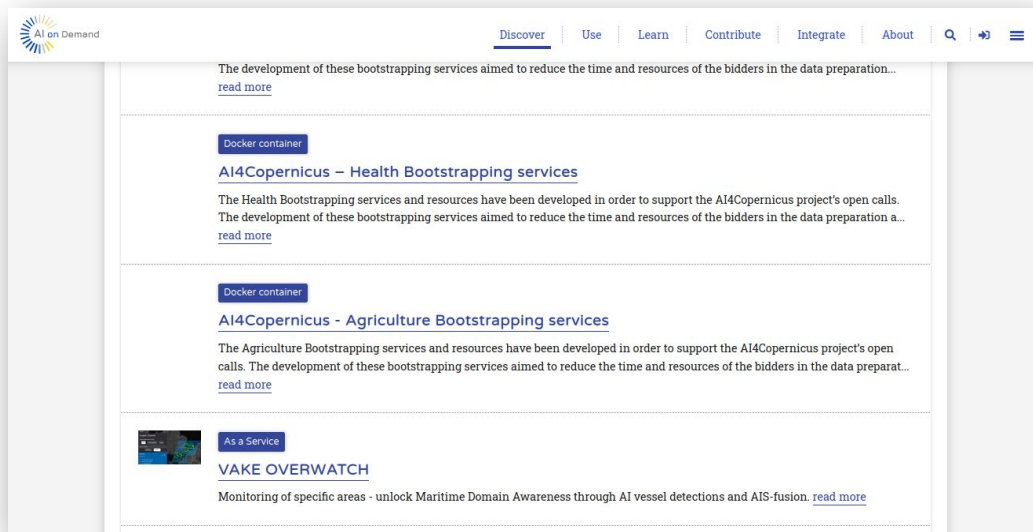
- Copernicus is the European programme for monitoring the Earth
- Set of systems that collect data from satellites and in-situ sensors
- Free and openly accessible to users
- To facilitate and standardise access to data, the EC has funded the deployment of five DIASes



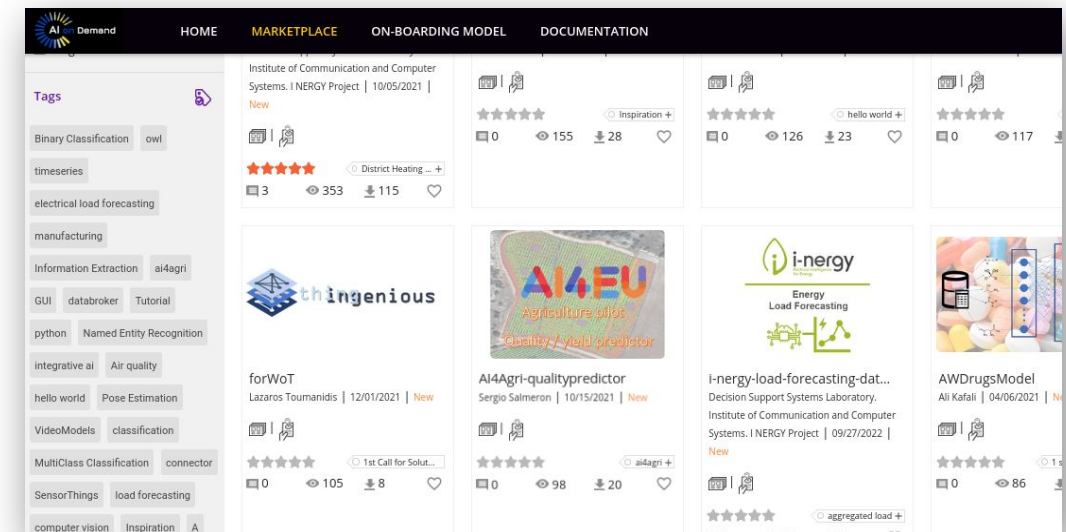
The AI-on-Demand platform



The AI on-Demand Platform <https://www.ai4europe.eu/> (AIoD) is a platform for sharing AI resources produced in European projects, including high-level services, expertise in AI research and innovation, AI components and datasets, high-powered computing resources. It offers a catalogue of AI assets an open source platform for experimenting and deployment of AI pipelines.



AIoD Catalogue



AI4Experiments

AI4Copernicus in a nutshell

AI4Copernicus Aims

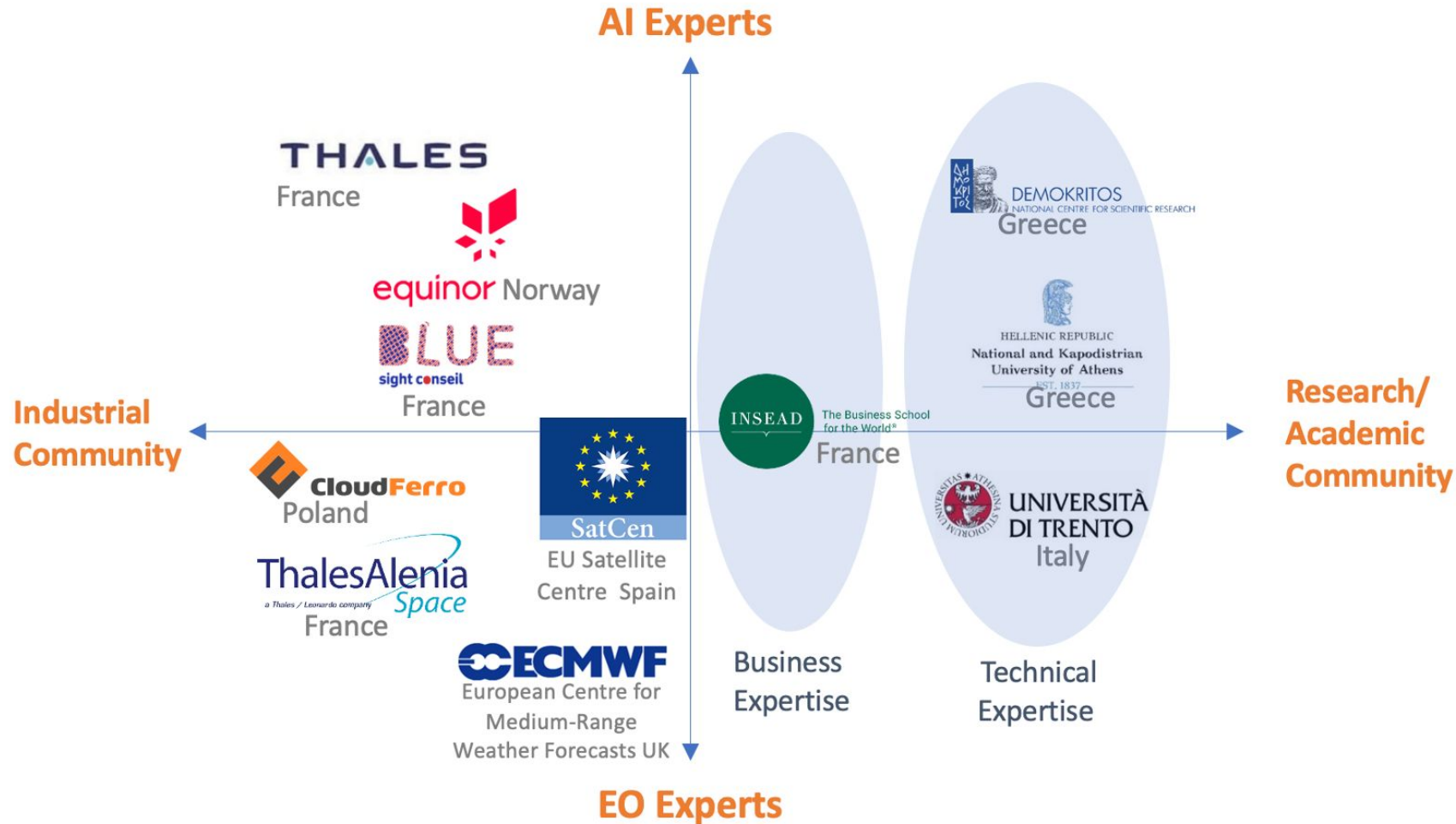
AI on Demand Platform aims to be the one-stop shop for AI methods, datasets and community in Europe



EO data and services have reached a significant level of maturity via the **DIAS (Data & Information Access Services)** platforms and produce value in various domains

AI4Copernicus aims to bridge these two worlds:
Make the AI on Demand Platform, the platform of choice for users of Copernicus data along the value chain (scientists, SMEs, non-tech sector)

AI4Copernicus consortium

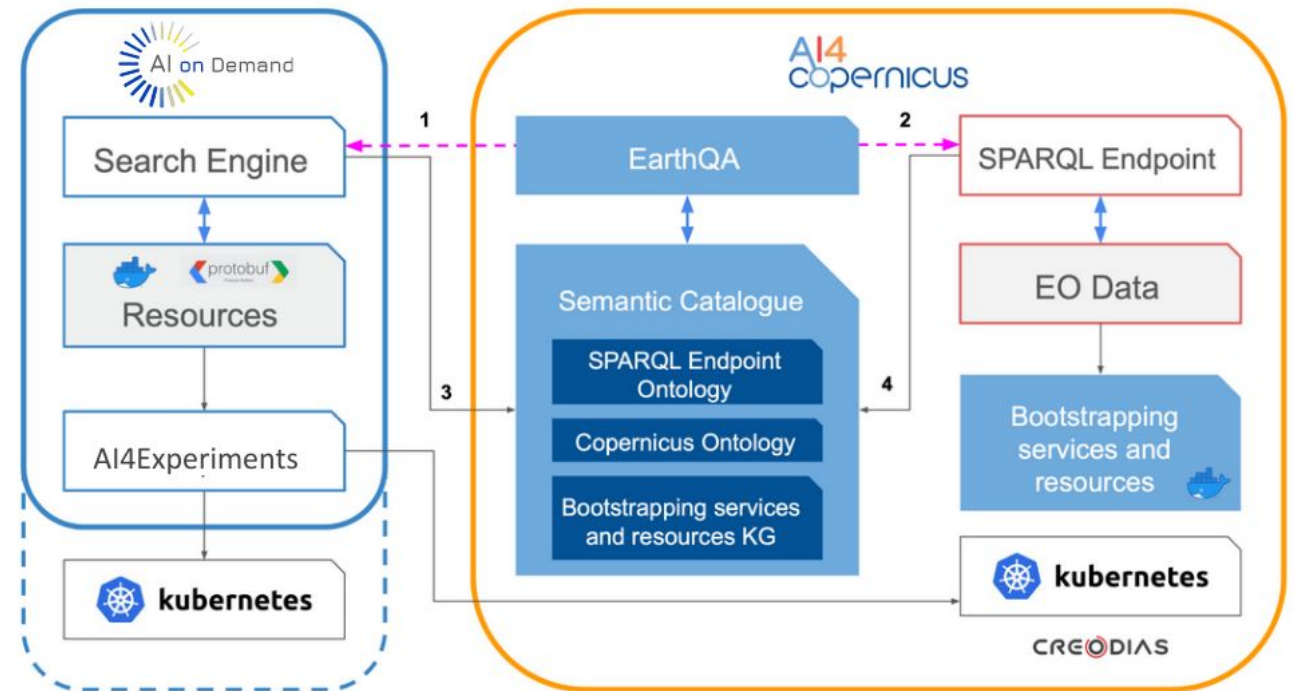


Main objectives

- Expand and deepen the integration of AIoD with DIAS platforms to enrich the AIoD service offering and enable far-reaching innovation.
- Kickstart the innovation cycle by incentivising diverse communities pertinent to the AIoD platform and Copernicus to solve real problems of business and societal value.
- Drive the evolution, uptake and impact of all involved platforms (AIoD, WEkEO, CREODIAS).

AI4Copernicus architecture

- ✓ Provision of services & resources (e.g., preprocessing tools, ML algorithms and models for EO data) to bootstrap the development of AI+EO applications
- ✓ Option to use AI4Experiments to create deployable AI pipelines, which users can deploy directly on DIAS
- ✓ Copernicus ontology, Semantic Web tools, and EarthQA question answering engine for annotating and discovering Copernicus data and services.



Bootstrapping services

- The bootstrapping resources include a set of services made available from the Security, Agriculture, Energy, & Health domains for the Open Call winners.
- The aim is to reduce the time and resources in tasks as data access, pre-processing, labelling datasets, ML algorithm definition, etc.
- Most services are available as dockerized applications that can be executed in any environment with a properly configured docker client.

Domain	Resource
Security	Sentinel-1 GRD pre-processing
	Sentinel-1 SLC pre-processing
	Sentinel-2 pre-processing
	Sentinel-1 change detection–ACD and MTC
	Sentinel-2 change detection
	Vector data of human features
Agriculture	Deep network for pixel-level classification of S2 patches
	TimeSen2Crop Dataset
	Harmonization of pre-processed time series of Sentinel-2 data
	LST Memory Neural Network for Sentinel-2
	Pre-Trained LST Memory
Energy	Energy Datasets
Health	Probabilistic downscaling of CAMS air quality model data
General	Semantic-Web toolkit (Tools for transformation, querying, interlinking, federating and visualizing big linked geospatial data)
	EarthQA question answering engine

AloD catalogue and AI4Copernicus



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Contribute

Integrate

About



The development of these bootstrapping services aimed to reduce the time and resources of the bidders in the data preparation...

[read more](#)

Docker container

AI4Copernicus – Health Bootstrapping services

The Health Bootstrapping services and resources have been developed in order to support the AI4Copernicus project's open calls.

The development of these bootstrapping services aimed to reduce the time and resources of the bidders

[read more](#)

Docker container

AI4Copernicus - Agriculture Bootstrapping services

The Agriculture Bootstrapping services and resources have been developed in order to support the AI4C calls. The development of these bootstrapping services aimed to reduce the time and resources of the bi

[read more](#)

As a Service

VAKE OVERWATCH

Monitoring of specific areas - unlock Maritime Domain Awareness through AI vessel detections and AI

As a Service

VAKE PATHFINDER

Monitor the tracks of specific ships - confirm AIS positions and fill in the gaps from periods of dark acti learning ship detections. [read more](#)



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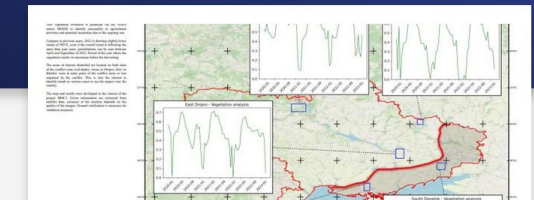
Home > Research > AI Assets > Environment monitoring in Ukraine conflict areas

Environment monitoring in Ukraine conflict areas

The main sources of potential pollution during armed conflicts are usually heavy industrial sites and critical infrastructure that, when damaged, could result in major chemical releases. Therefore, a useful starting point is to identify vulnerable locations associated with such sites. For Ukraine, oil and gas industries are of particular relevance as well as the nuclear plants. Also agriculture activity is one of the most important sectors for Ukraine economy with a global relevance in terms of food security. Ukraine is one of the biggest exporters of wheat, delivering to many countries, where the food situation is linked to the production of it. In this context of war, many agricultural fields have been abandoned due to the lack of people.

[Docker Super-Resolution algorithm](#)

[SR4CS](#)



AI4Copernicus – Health Bootstrapping services

The Health Bootstrapping services and resources have been developed in order to support the AI4Copernicus project's open calls. The development of these bootstrapping services aimed to reduce the time and resources of the bidders in the data preparation and allow them to focus on the development of innovative services based on AI.

[Docker container](#)

[Docker container](#)

[Link to the asset](#)

[Github with the source code of the cont...](#)

License

Other

To be used in the scope of AI4Copernicus project.

Main Characteristic

AI4Copernicus health service: downscaling CAMS model output with deep learning.

Technical Categories

[AI services](#)

Business Categories

[Earth Observation](#)

Open calls



Open Calls for Use Cases in 4 Industrial Domains

1st

30th Sept. 2021 € 150K

Open Call for Citizen Social Challenges

2nd

31st Oct. 2021 €5K

Open Call for Experiments

3rd

30th Apr. 2022 €80K

Open Call for Use Cases based on the Citizen Social Challenges

4th

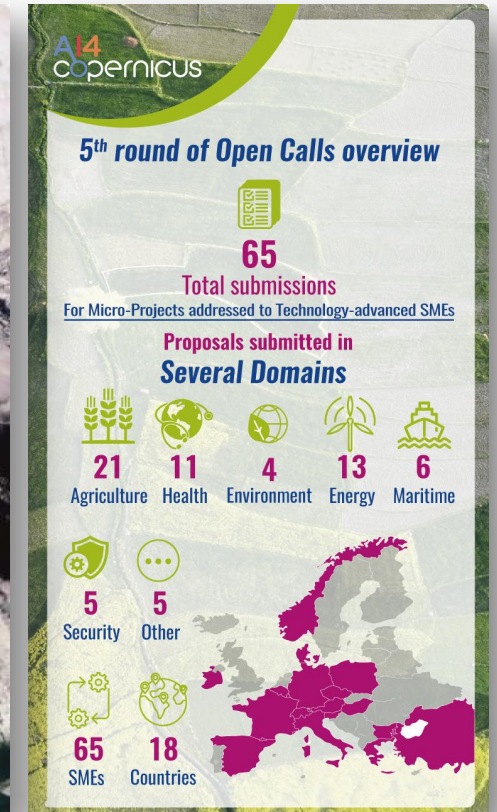
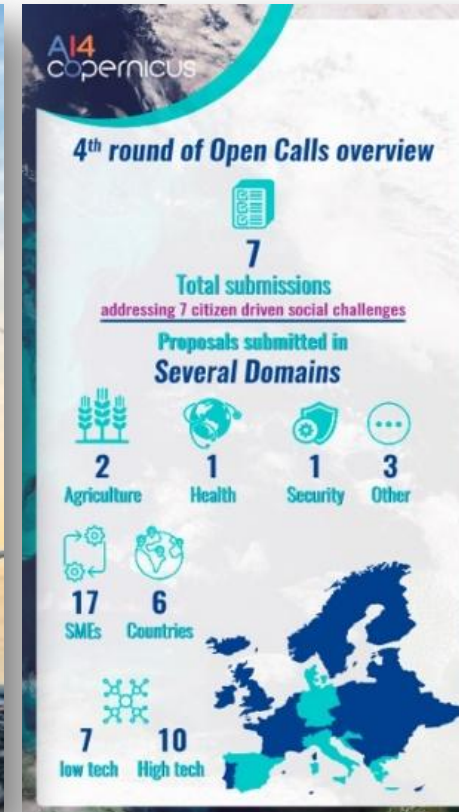
30th Apr. 2022 € 150K

Open Call for Micro-Projects

5th

31st Mar. 2023 €30K

Open Calls Results



Open Calls Projects summary

Open Call	#projects	Domains & #projects per domain	Status
1 st	6	Security:3, Agriculture:2, Energy:1	Completed
3 rd	8	Agriculture:5, Health:1, Maritime:1, Safety/Disaster risk reduction: 1	Completed
4 th	3	Urban Monitoring & Planning:1, Security:1, Agriculture:1	Completed
5 th	10	Agriculture:3, Health:3, Energy:2, Environmental:1, Education:1	In Progress
total	27	Security:4, Agriculture:11, Health:4, Energy:3, Other:5	In Progress

Services from the Open Calls in AIoD

Project	Open Call	Domain	Project / Service summary	# Organizations	# AI Assets
SR4C3	1	Security	Urban monitoring and abandoned crop detection in conflict areas	2	2
SCAVIHO	1	Agriculture	NDVI monitoring and harvesting forecasting	2	2
SLIDE	1	Energy	Short-term irradiation prediction in solar farms	2	1
VALENS	1	Security	Persistent anchorage monitoring and vessel detection	3	1
Sen4Weeds	1	Agriculture	In-fields weed detection using super-resolution	3	3
HumanityWatch	1	Security	Land and water monitoring for humanitarian crisis areas	2	1
ODFuse4Ship	3	Maritime	Ocean Data Fusion for short-term route optimization through current maps	1	1
Lobelia Air	3	Health	Hourly high-resolution air quality monitoring and forecasting	1	1
EO4NOWCAST	3	Security	Natural hazard prediction for river/urban floods and landslides	1	3
ESFA	3	Agriculture	Empirical season forecast for agriculture	1	2
PLANET	3	Agriculture	Climate Risk assessment for land suitability	1	1
FertiRec	3	Agriculture	Fertilizer rate recommendation system	1	1
OPTIMAL	3	Agriculture	Irrigation area monitoring and forecast, water resources usage optimisation	1	1
LIVE4ENV	3	Agriculture	Optimizing natural resources usage and reducing the negative effects of livestock farming	1	1
Urbalytics	4	Urban	Urban Heat Island Assessment and Climate Change Adaptation	2	1
AI4EO.Green	4	Agriculture	Green space monitoring for Golf courses & Urban green space management	3	1
AI-RON MAN	4	Security	Short-term wildfire risk assessment	3	3
Total:				30	26

Current: CREODIAS Deployer

- Deployment service for [AI4Experiments](#), enabling automated deployments of pipelines to CREODIAS platform
- Developed by CloudFerro with the help of FHG
- Tested and available in the production platform



The screenshot displays the AI4Demand platform interface. The top navigation bar includes a hamburger menu, the AI4Demand logo, a search icon, a notification bell, a user profile for 'Lukasz', and a help icon. The main content area is titled 'Sudoku Tutorial' and shows the model's catalog path, version, and creation details. A sidebar on the left provides navigation options like HOME, MARKETPLACE, MY MODELS, ON-BOARDING MODEL, DESIGN STUDIO, Q AND A, and ML LEARNING PATH. The main content area features a 'Description' tab, a license profile, a signature, documents, model artifacts, and author/publisher details. A 'Deploy for Execution' dropdown menu is open, showing deployment targets: Local Kubernetes, Preprod AI-Lab Playground, Creodias Deployer, and Dev01 Playground. The main content area also displays a 5x5 Sudoku grid with a green cell containing the number 6. The bottom of the page shows 'Other Prediction Models' and a 'RATE: Sudoku Tutorial' section.

Thank You!



Any Questions?



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