

AI4EOSC : customizable AI platform in the EOSC context

AI4

eosc

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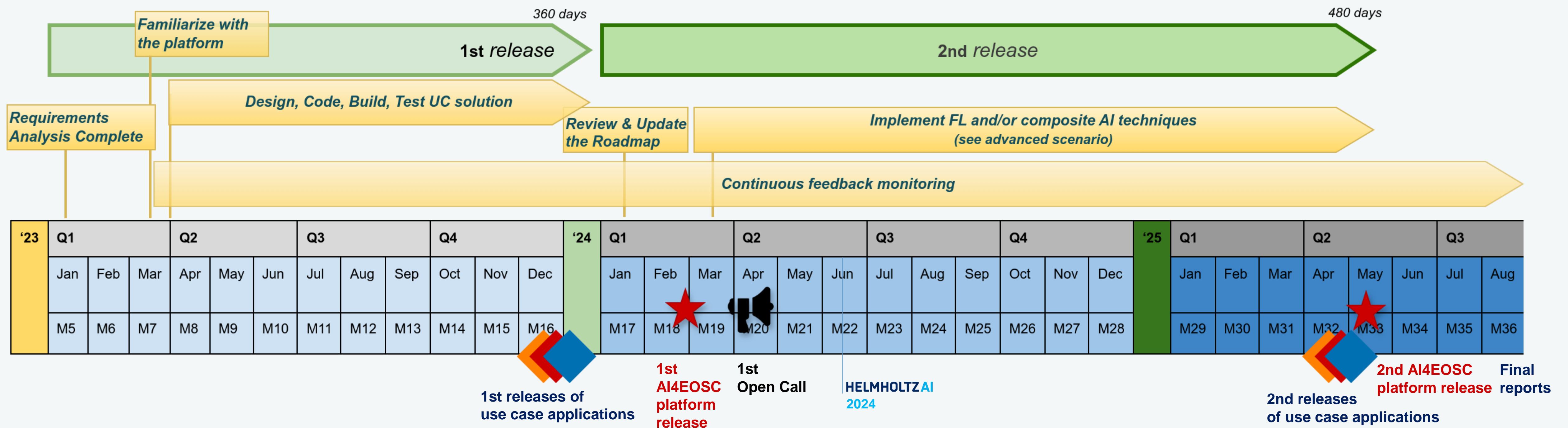
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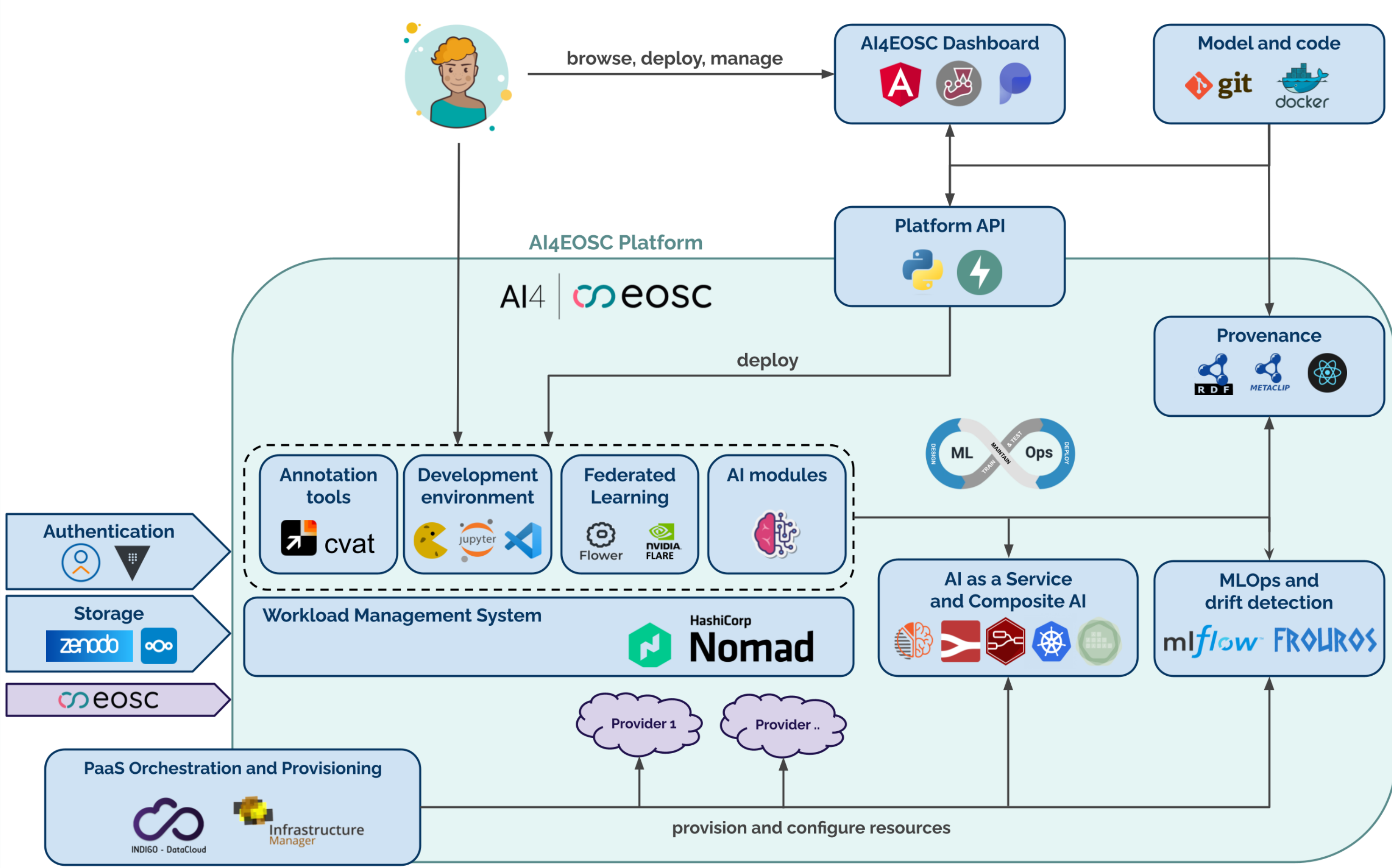
AI4EOSC will significantly enhance the "Enabling an operational, open and fair EOSC ecosystem" (INFRAEOSC) goal by creating a **FAIR** and **open platform** tailored to the needs of researchers and engineers who use AI/ML/DL techniques. The research effort targets to provide advanced features on the platform like **federated learning**, **split learning**, **AI/ML/DL experiment tracking**, domain **metadata**, and model **provenance**, means to identify a **concept drift** and **data drift**, and also aims on how to manage distributed computing infrastructures. The platform is designed to support the discovery, access, and reuse of data, services, and tools, enabling more efficient and effective research and development.



Project roadmap



Conceptual Architecture



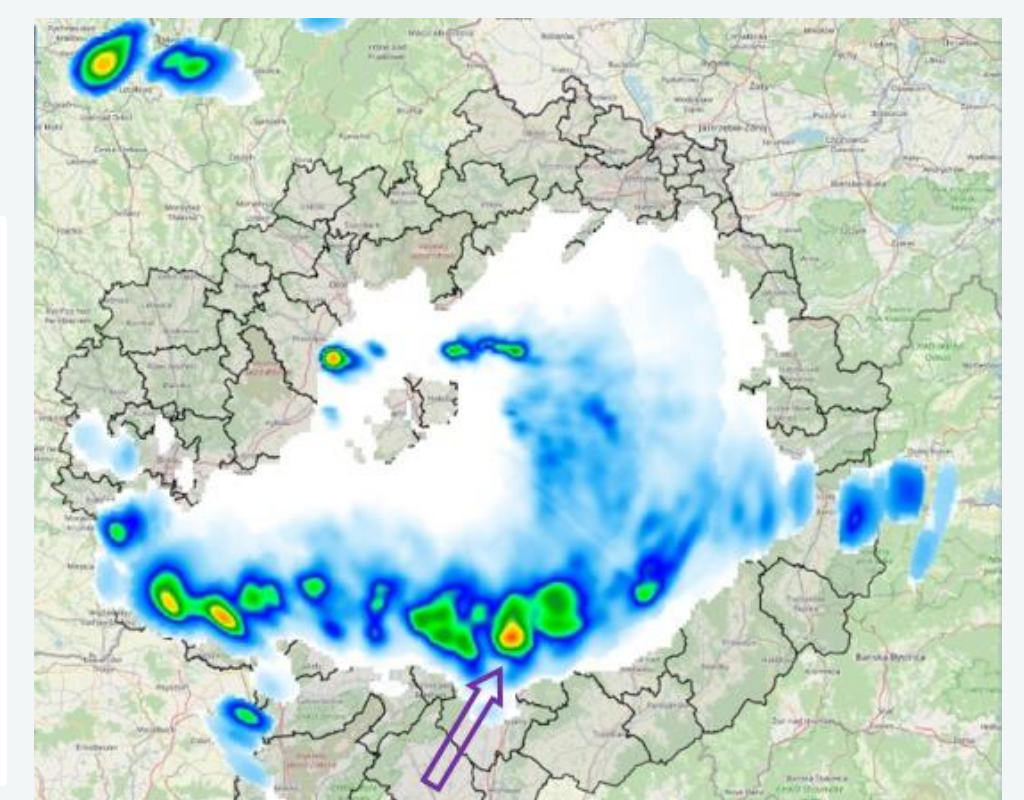
KEY FEATURES:

PLATFORM CUSTOMIZATION, EVENT-DRIVEN DATA PROCESSING, COMPOSITE AI, FEDERATED / SPLIT / DISTRIBUTED LEARNING, MLOPS, EXCHANGE ACTIVITY, FAIRNESS, PROVENANCE

Use Cases

Agrometeorology:

Problem solving: Early warnings for farmers before approaching thunderstorms using AI techniques
Target users: Farmers, pub. administration, local governments
Domain: Agrometeorology
AI product: Forecasting system
Partners: MicroStep-MIS, IISAS, CSIC, Predictia



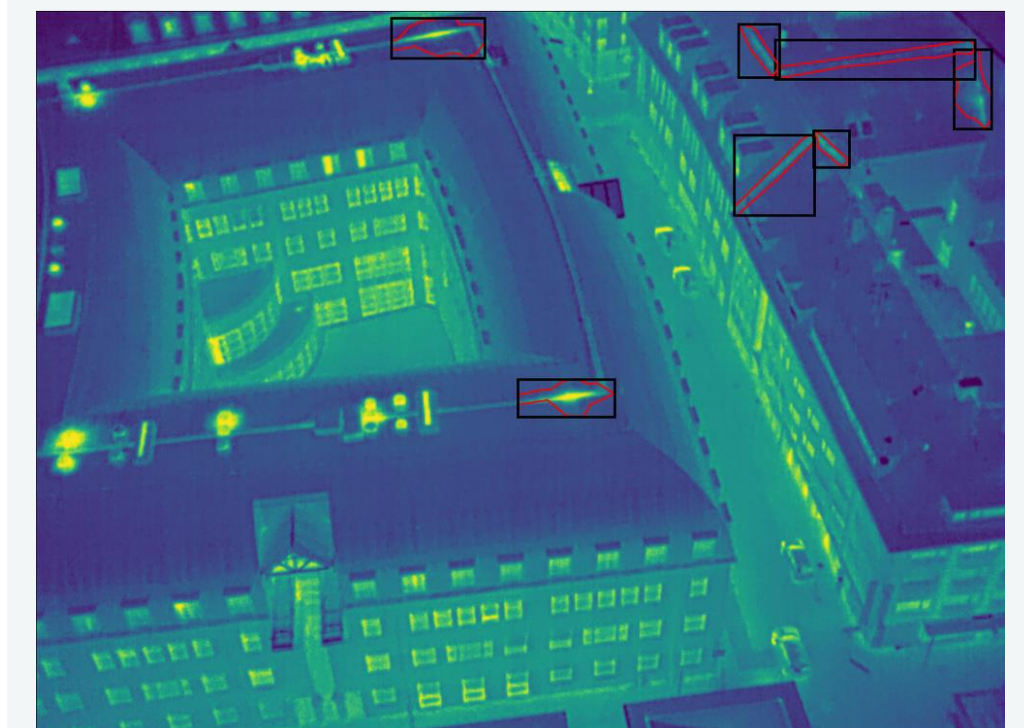
Integrated Plant Protection:

Problem solving: Reinforce the quality & quantity of food
Target users: Farmers, public administration, local governments, scientific institutions
Domain: Agriculture
AI product: Recognizing plant diseases
Partners: PSNC, WODR



Automated Thermography:

Problem solving: Identifying energy losses to mitigate their effects and enable higher system efficiency
Target users: Urban planners, district heating network operators, data collectors
Domain: Energy (retrofitting / monitoring)
AI product: Detection of thermal hotspots caused by thermal bridges and common urban features
Partners: KIT-IIP, KIT-SCC (+Helmholtz-AI)

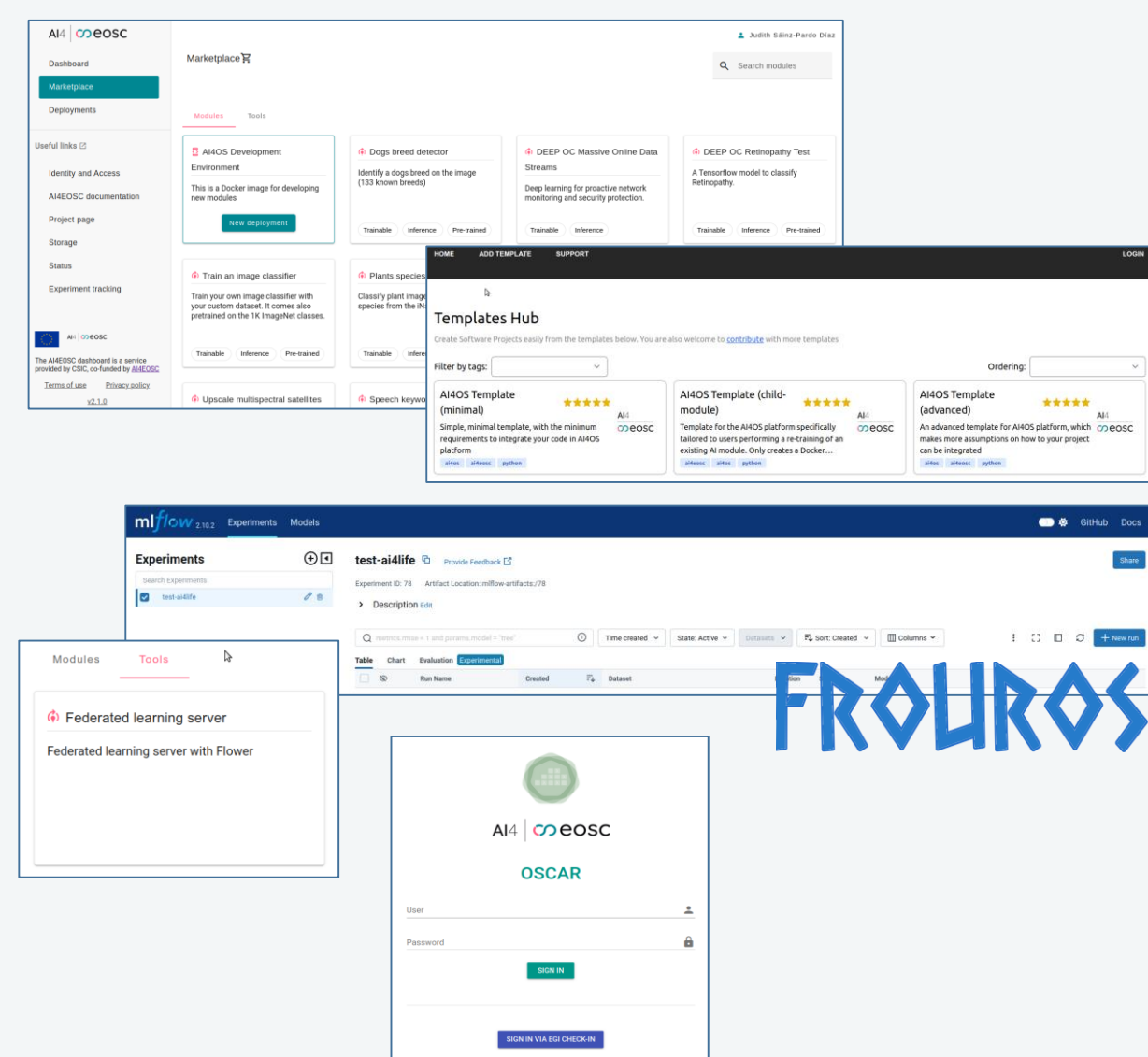


Status & Outlook

- ✓ 1st release of the [AI4OS](#) software stack and the [AI4EOSC](#) platform
- ✓ [iImagine](#) AI platform is powered by AI4OS (see poster P-02-42)
- ✓ 1st Open Call for new use cases

The platform offers today:

- ✓ [Marketplace](#) for AI applications
- ✓ [Templates hub](#) to create your own projects
- ✓ Development Environments (Jupyter, VSCode)
- ✓ Easy GPU access & Storage ([Nextcloud](#))
- ✓ Experiment tracking with [MLflow](#)
- ✓ Drift detection with [Frouros](#)
- ✓ Federated learning with [Flower](#)
- ✓ Composite AI via [Flowfuse](#) and [Elyra](#)
- ✓ Serving AI models for Inference via [OSCAR](#)



Upcoming:

- More Open Calls for new use cases (check [ai4eosc.eu](#))
- Annotation tools (e.g. [CVAT](#))
- Drift monitoring with Web GUI and history (see poster P-03-04)
- Federated/Swarm learning with [Nvidia Flare](#) (see posters P-02-04, P-04-05)
- Split learning
- Parallel training with [Horovod](#)
- Model provenance
- Automatic [Zenodo](#) integration & FAIR-ification of AI/ML assets
- Integration with [EOSC](#) ecosystem repositories for data ingestion



AI4EOSC Consortium

Runtime: 36 months, Sep 2022 - Aug 2025

Partners: 7 academic + 2 SME + 1 non-profit organization from 6 countries

Further information, contact: ai4eosc-po@listas.csic.es

