

# iMagine: Empowering Aquatic Research through AI-Driven Tools for Imaging Data Analysis



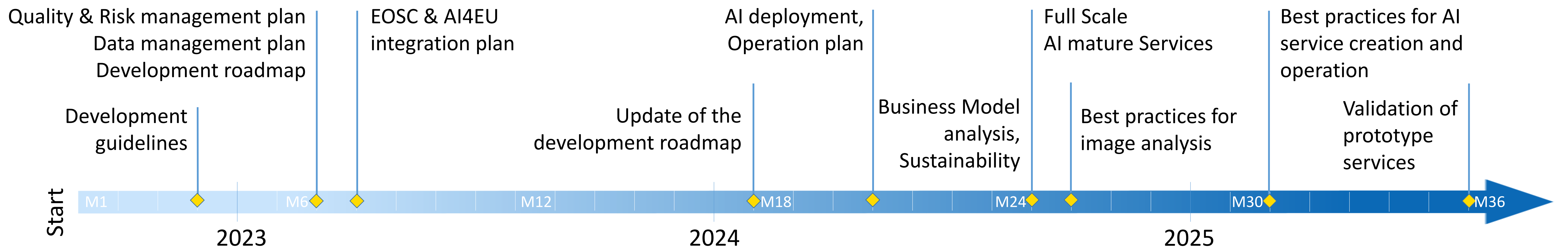
Presenter: Elnaz Azmi (KIT) [elnaz.azmi@kit.edu](mailto:elnaz.azmi@kit.edu)

Khadijeh Alibabaei (KIT), Valentin Kozlov (KIT), Álvaro López García (CSIC), Dick Schaap (MARIS), Gergely Sipos (EGI)

## Objectives

- Enhancing aquatic research utilizing AI applications
- Leveraging EOSC for developing, training, and deploying AI models
- Online data stream analysis in distributed environments
- Facilitate collaboration among research infrastructures to share images and AI applications
- Developing best practices for delivering image processing services

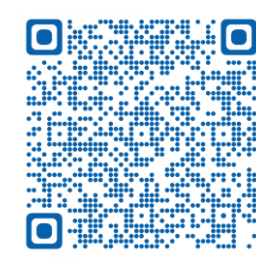
## Roadmap



## Use Cases

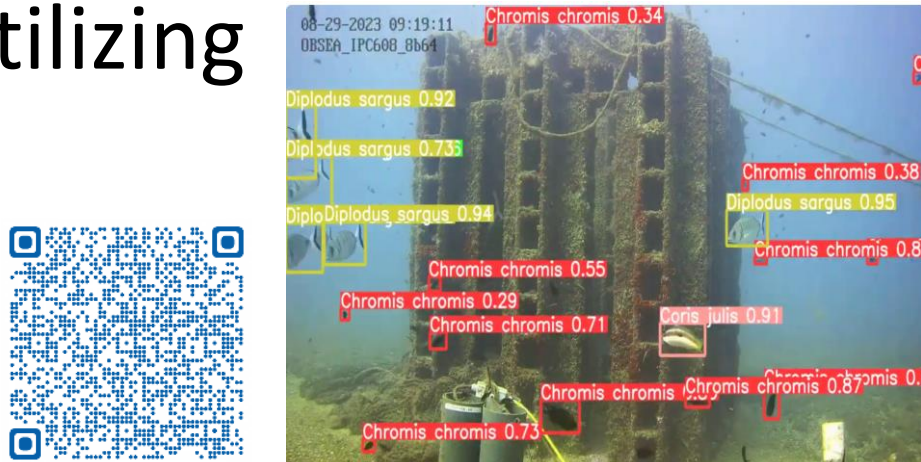
Eight internal and three external AI-based image analysis use cases in aquatic sciences

[iMagine Open Call for Use Cases](#)



### Marine Ecosystem Monitoring

Ecosystem monitoring utilizing video imagery (EMSO ERIC, UPC, IFREMER, MI)



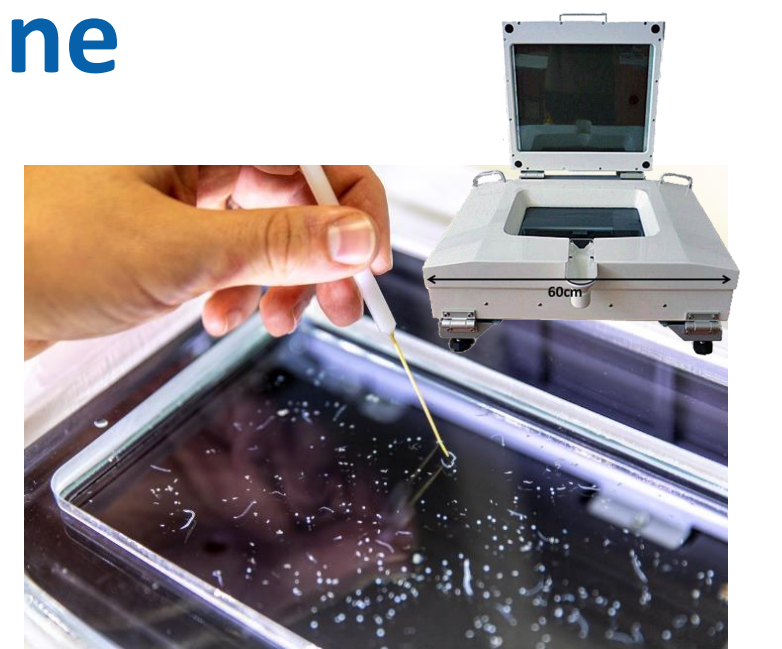
### Marine Litter Assessment

Monitoring system for aquatic litter pollution using drones (DFKI, MARIS, OGS)



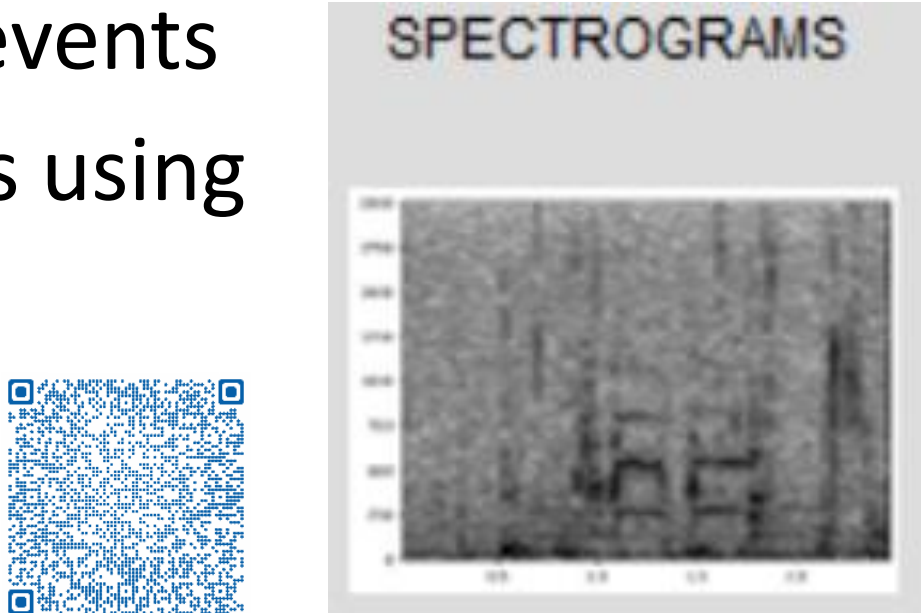
### Zooscan – EcoTaxa Pipeline

Taxonomic identification of zooplankton using Zooscan (Sorbonne Université)



### Underwater Noise Identification

Identification of sound events from acoustic recordings using spectrograms (VLIZ)



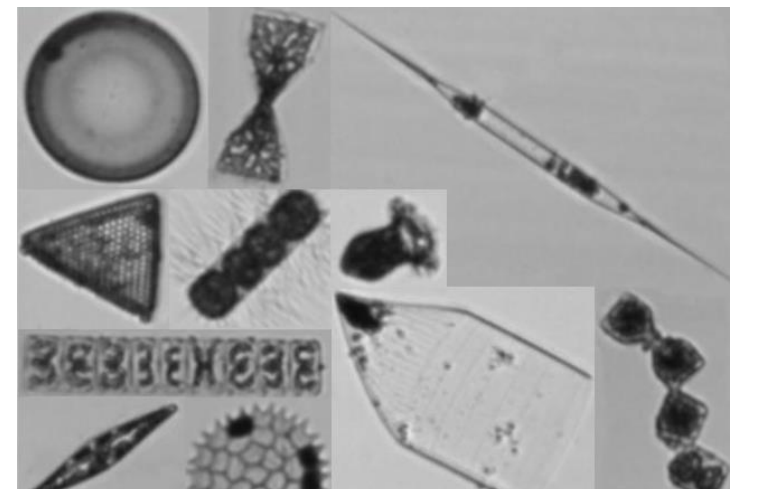
### Oil Spill Detection

Detection of oil spill from satellite images (CMCC, OrbitalEOS, UNITN)



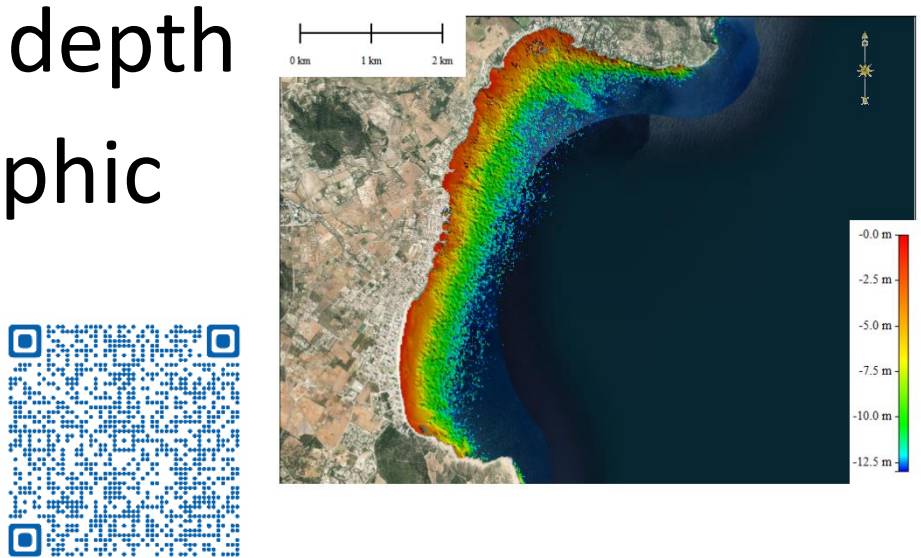
### FlowCam Phytoplankton Identification

Taxonomic identification of phytoplankton using FlowCAM images (VLIZ)



### Satellite-Derived Bathymetry

Forecasting underwater depth across varied oceanographic condition (ICMAN, CSIC)



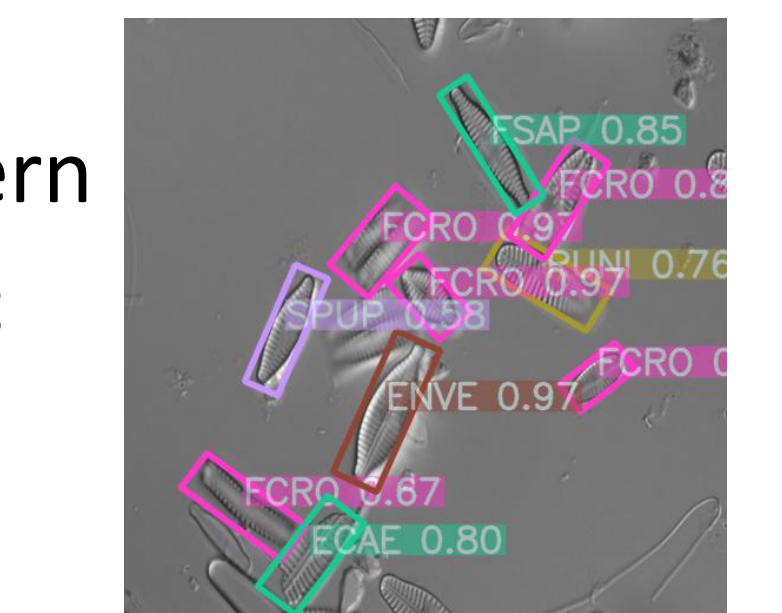
### Beach Monitoring

Posidonia oceanica berms and rip-currents detection from beach monitoring systems (SOCIB)



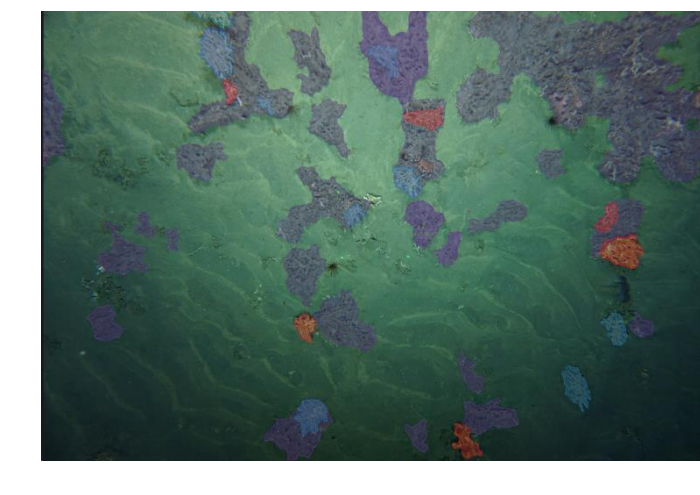
### Freshwater Diatoms Identification

Diatom-based bioindication service using automatic pattern recognition from microscopic images (UL-LIEC)



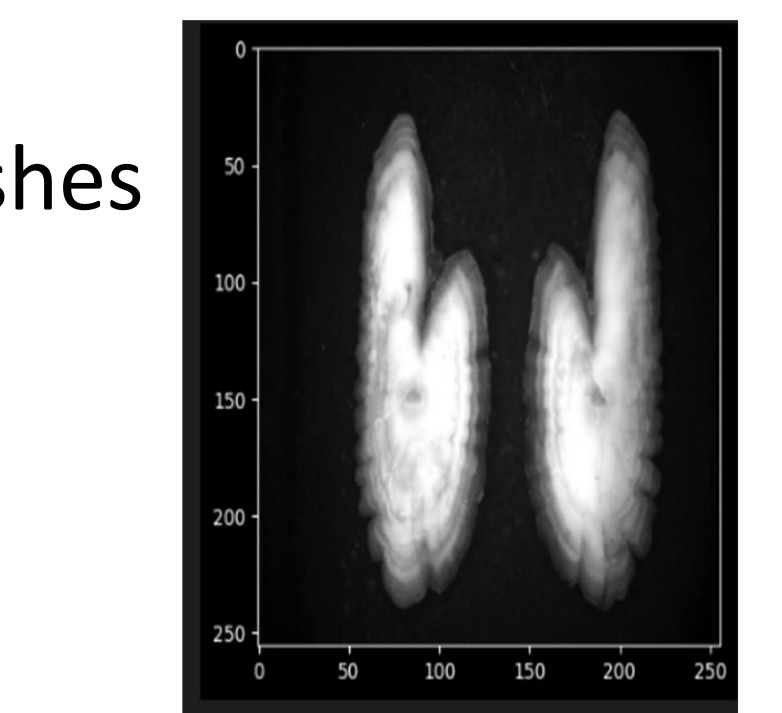
### Cold Water Coral Reefs

Identification of recoveries, degradation of the habitat or anomalous mortality events (IEO, CSIC)

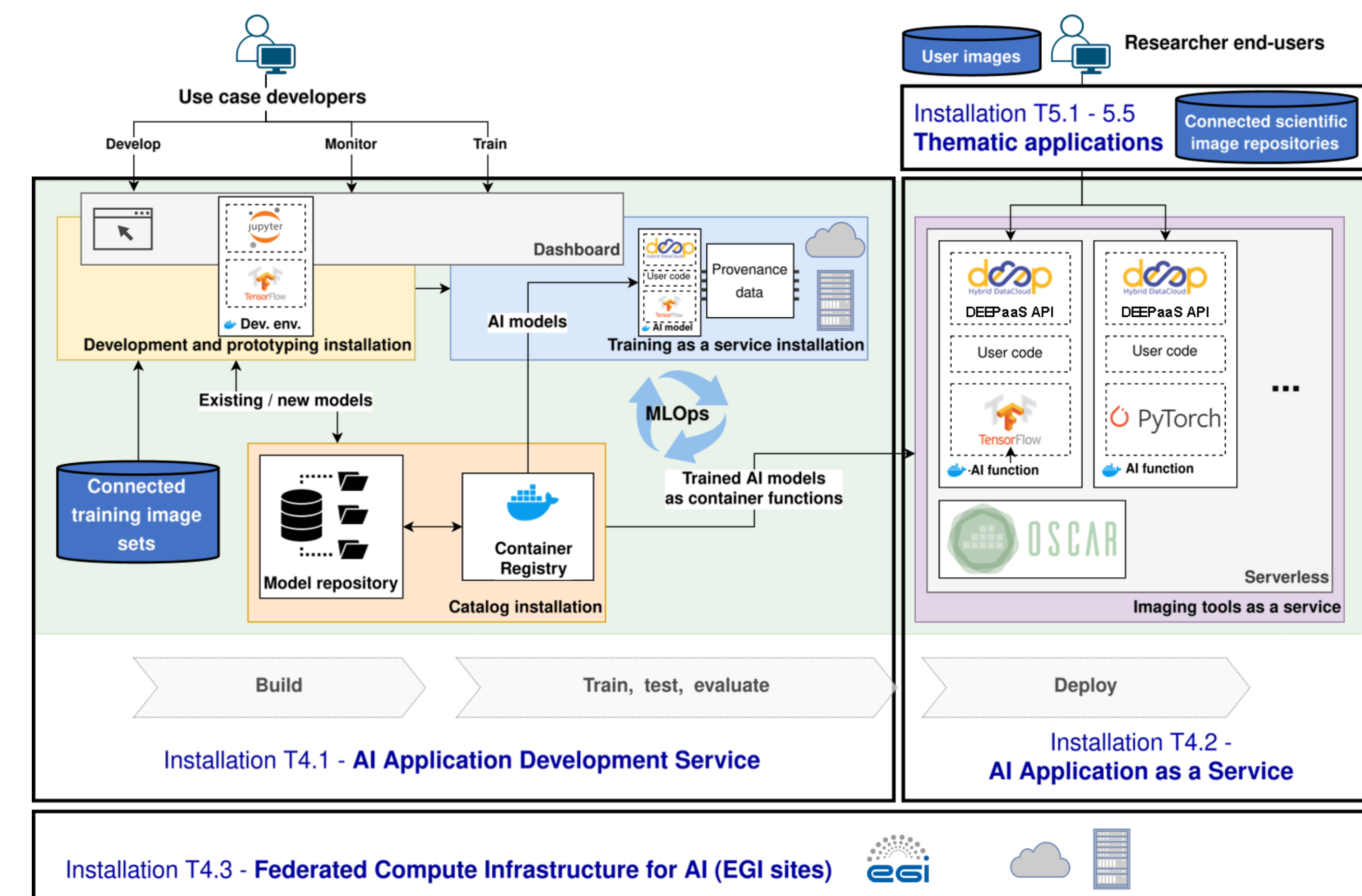


### Fish Otoliths

Identification of the age of fishes from otoliths images (DTU)



## AI Platform Architecture



## iMagine Consortium

Project time: Sep. 2022 – Aug.2025 (36 months)

24 partners from 11 countries: Belgium, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Slovakia, Spain, and Turkey

