https://platform.destine.eu/

DestinE AI Capabilities

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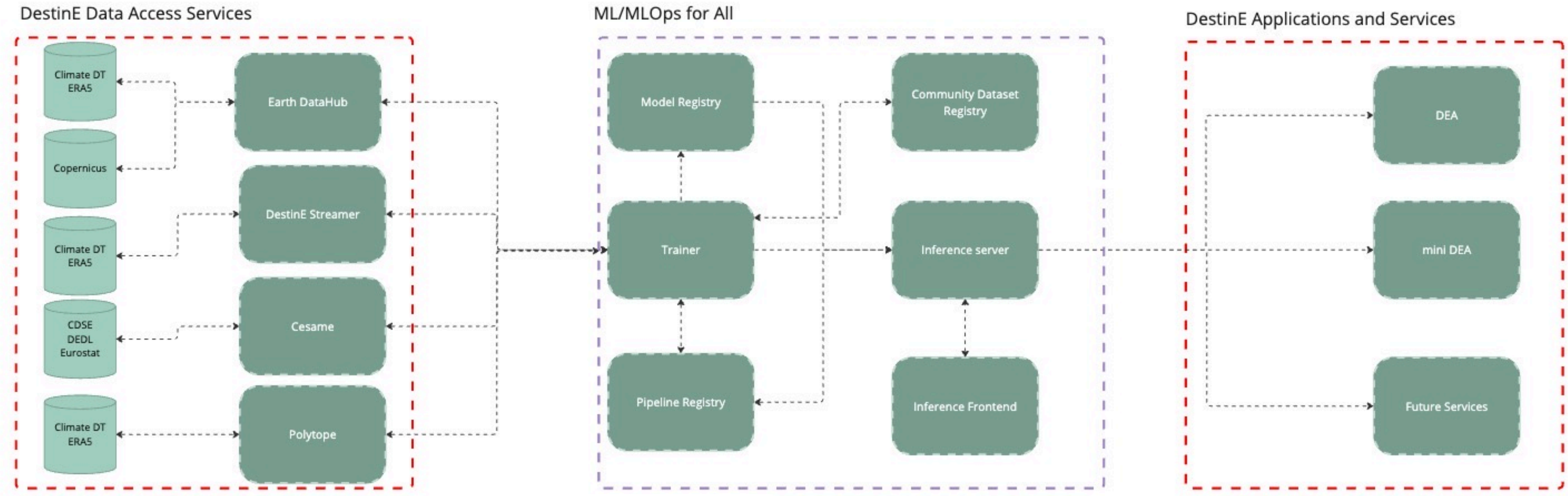
Destination Earth Funded by the European Union Implemented by ECMWF esa EUMETSAT

High Level System Overview



DestinE Data Access Services

- Climate DT ERA5
- Copernicus
- Climate DT ERA5
- CDSE DEDL Eurostat
- Climate DT ERA5
- Earth DataHub
- DestinE Streamer
- Cesame
- Polytope

ML/MLOps for All

- Model Registry
- Community Dataset Registry
- Trainer
- Inference server
- Pipeline Registry
- Inference Frontend

DestinE Applications and Services

- DEA
- mini DEA
- Future Services

PyTorch Lightning

CLEAR|ML

mlflow™

Docker Registry

gradio

FastAPI

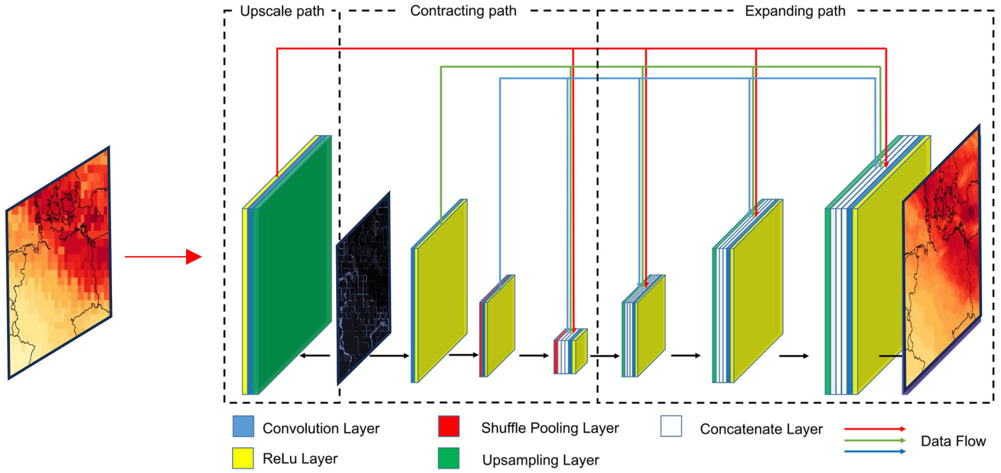
Phase 1 - In Production

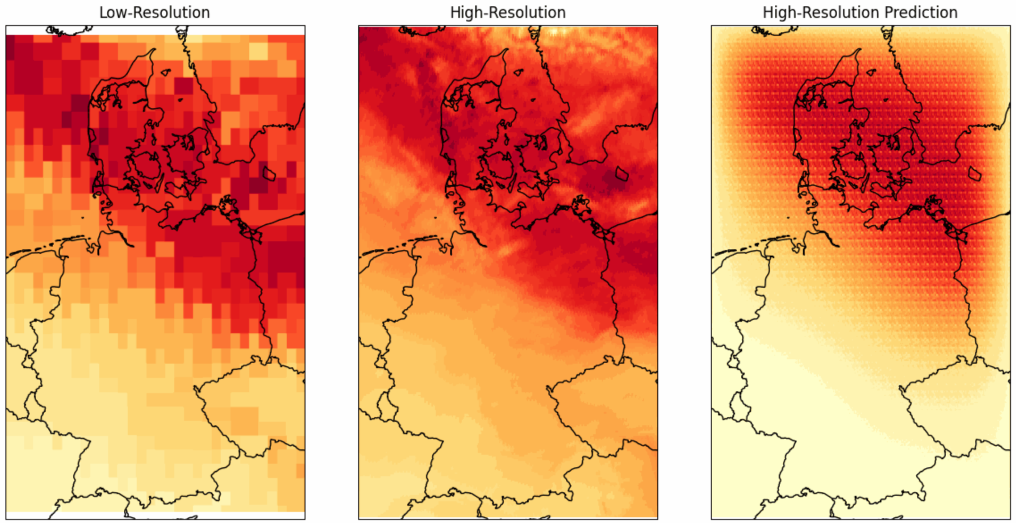
Phase 2 - Next Year

Basic Streaming Deep Learning Super Resolution

ResNet model x 8 Super Resolution

- Data are streamed via accessing Earth DataCube service into DataLoader.
- Input: Climate DT t2m, IFS-NEMO, hourly data on single-levels, standard (LR)
- Ground True: Climate DT t2m, IFS-NEMO, hourly data on single-levels, HR
- Upscaling from (0.35°x 0.35°) to (0.04° x 0.04°)
- Super Resolution performed with only one parameters [t2m]
- Possibility to extend to N sources and N Parameters


Upscale path
Contracting path
Expanding path
Convolution Layer
ReLu Layer
Shuffle Pooling Layer
Upsampling Layer
Concatenate Layer
Data Flow


Low-Resolution
High-Resolution
High-Resolution Prediction

Training performed over 1 month – 100 epochs – metrics tracked MSE / SSIM / PSNR.

- Benefits of Streaming ML
  - No need to download data locally
  - Standard access to data
  - Standard inference by everyone
  - Infrastructure efficiency
  - Reduces the need for large-scale batch processing
  - Brings more flexibility for developing model (multi data sources input)

PyTorch Lightning

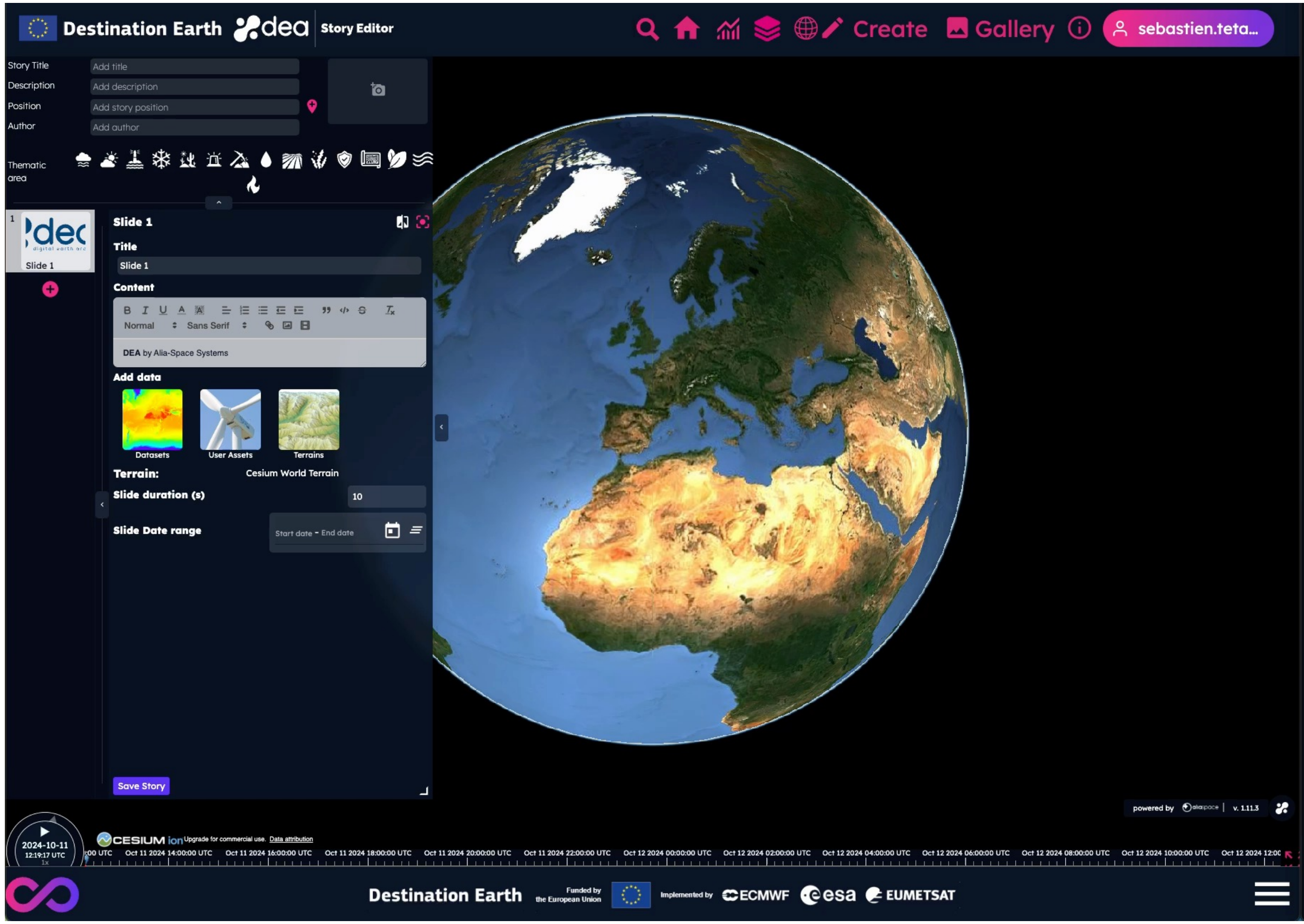
gradio

Zarr

Demo Time

DEMO TIME!
... WHAT COULD POSSIBLY GO WRONG
makeameme.org

From Training to Visualization


Destination Earth
dea
Story Editor
Create
Gallery
sebastien.teta...
Story Title
Description
Position
Author
Thematic area
Datasets
User Assets
Terrains
Slide Date range
Start date – End date
Save Story
powered by
v. 1.11.3
2024-10-11
CESIUM ion
Destination Earth
Funded by the European Union
Implemented by
ECMWF
esa
EUMETSAT

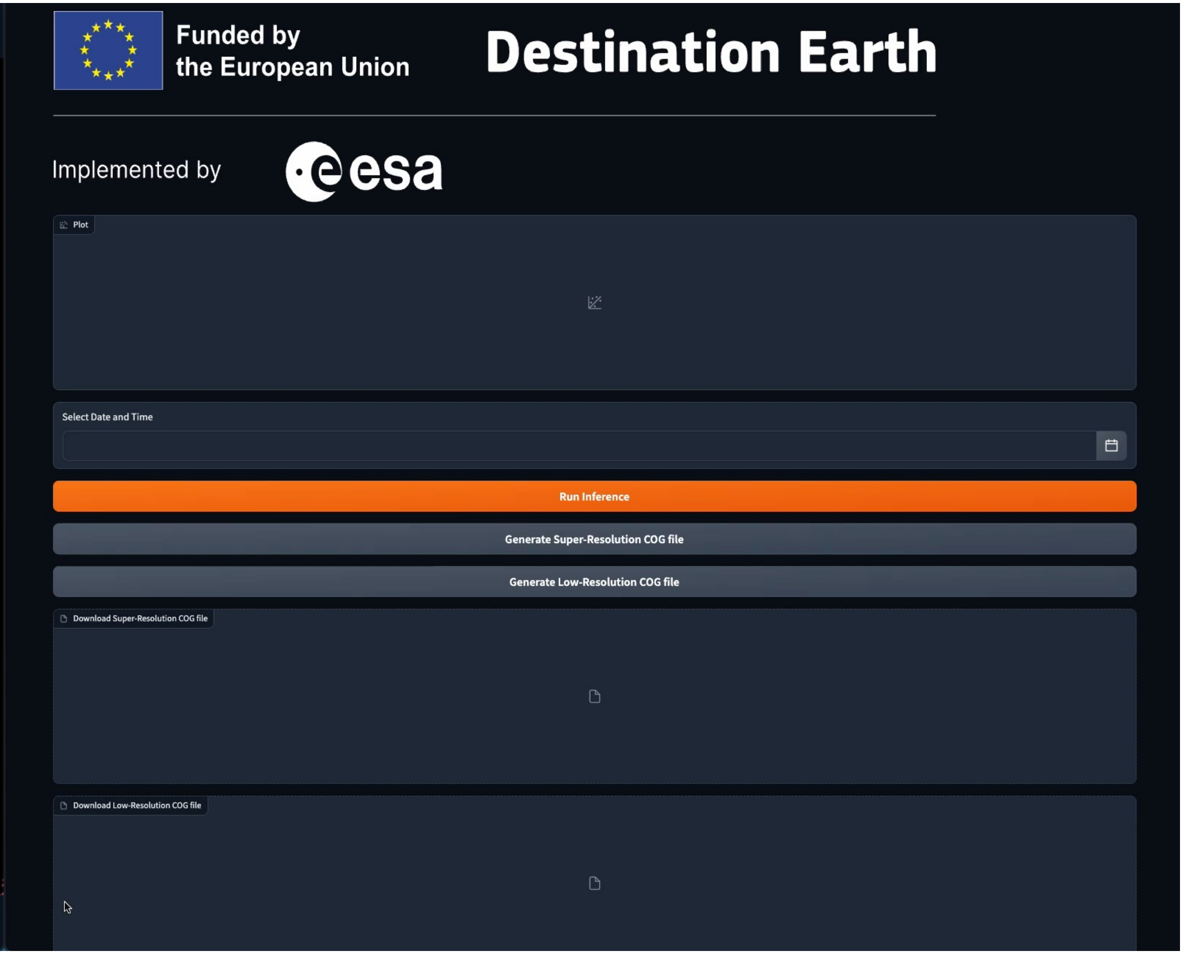
Slide 1

Title: Slide 1

Content: DEA by Alia-Space Systems

Terrain: Cesium World Terrain

Slide duration (s): 10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Destination Earth
Implemented by
esa
Plot
Select Date and Time
Run Inference
Generate Super-Resolution COG file
Generate Low-Resolution COG file
Download Super-Resolution COG file
Download Low-Resolution COG file

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Thank you!