Leveraging Pretrained Deep Learning Models to Extract Similarities for the Analog Ensemble Method Applied to Convection Satellite Imagery

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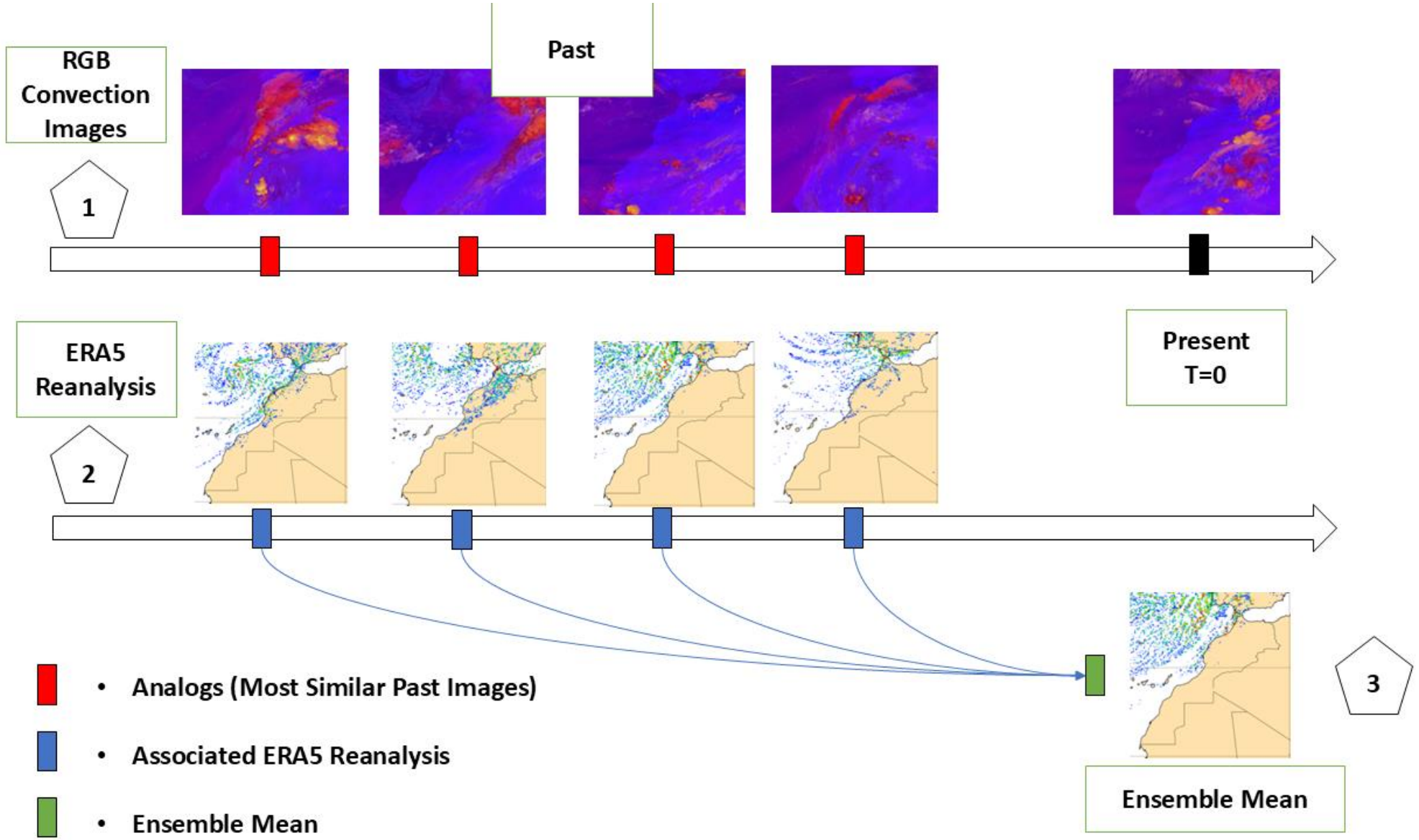
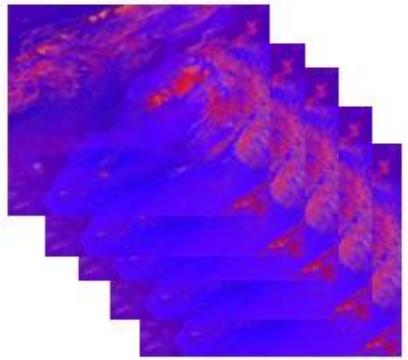
Analog Ensemble Method Adapted to Satellite Imagery

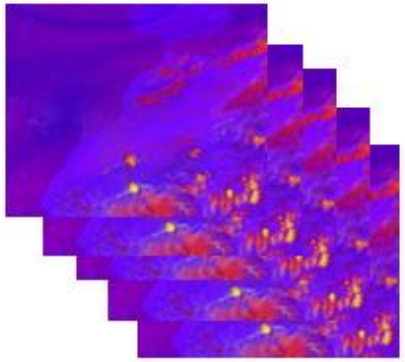


Evaluating RGB Convection Images Similarity with Pretrained DL



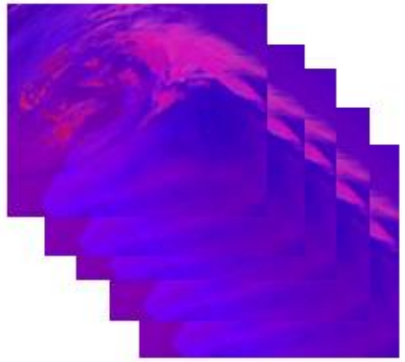
2020

.....

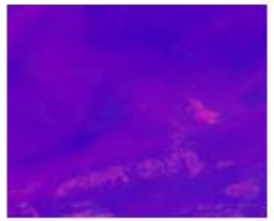


2022

.....



2023



2024

Data APIs:
EUMETSAT RGB
Convection

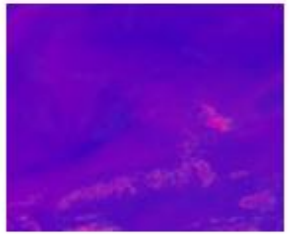
Past

Future

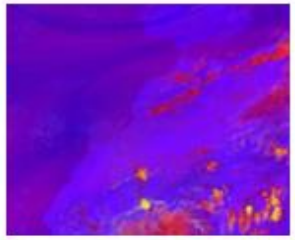
t = 0

Feature Extraction:
Pretrained DL Algorithms:
VGG16
Xception
Inception_ResNetV2

VGG-16



2024



2022

INPUT

3x3 Conv + Relu 64
3x3 Conv + Relu 64
2x2 Max-Pool 64
224 x 224

3x3 Conv + Relu 128
3x3 Conv + Relu 128
2x2 Max-Pool 128
112 x 112

3x3 Conv + Relu 256
3x3 Conv + Relu 256
3x3 Conv + Relu 256
2x2 Max-Pool 256
56 x 56

3x3 Conv + Relu 512
3x3 Conv + Relu 512
3x3 Conv + Relu 512
2x2 Max-Pool 512
28 x 28

3x3 Conv + Relu 512
3x3 Conv + Relu 512
3x3 Conv + Relu 512
2x2 Max-Pool 512
14 x 14

FC 4096
7 X 7

FC 4096

FC OUTPUT 1000

OUTPUT

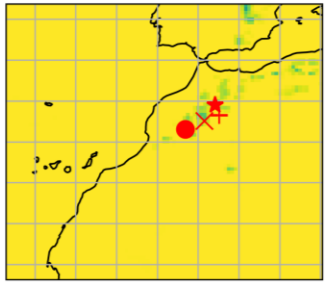
Features Vectors

Similarity Metrics:
RMSE
SSMI
Cosine Distance
Color Histogram

DL Feature Extraction & Pre-trained DL Fine-Tuning

Use Case 25-08-2024

2024-08-25 15:00



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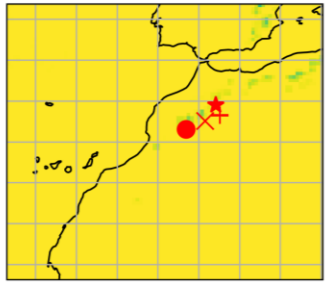

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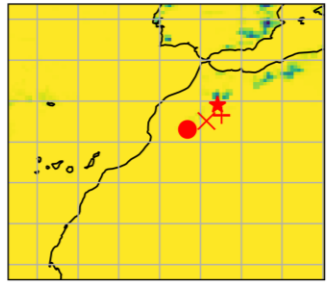

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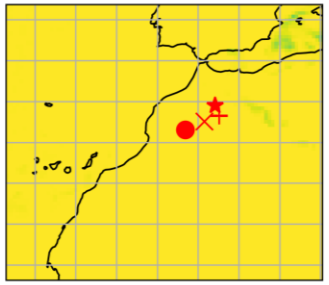

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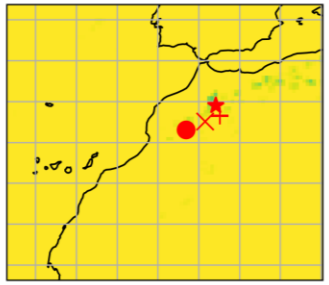

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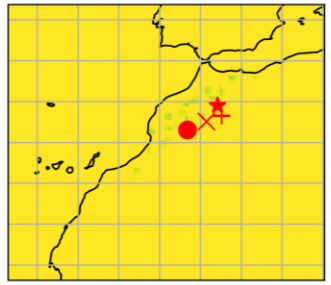

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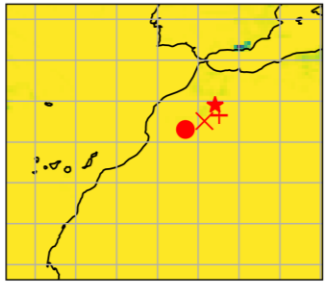

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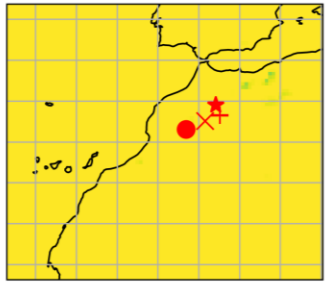

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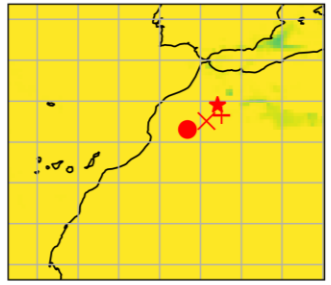
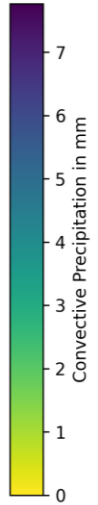
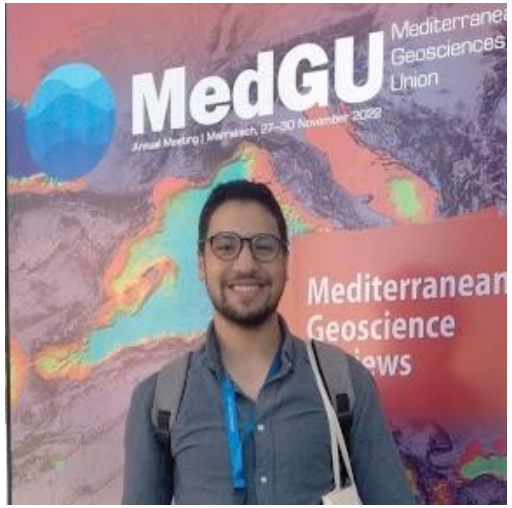




Thank you!



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Related Papers:

- Alaoui, B., Bari, D. & Ghabbar, Y. Surface Weather Parameters Forecasting Using Analog Ensemble Method over the Main Airports of Morocco. *J Meteorol Res* 36, 866–881 (2022). DOI: 10.1007/s13351-022-2019-0
- Alaoui, B.; Bari, D.; Bergot, T.; Ghabbar, Y. Analog Ensemble Forecasting System for Low-Visibility Conditions over the Main Airports of Morocco. Atmosphere 2022, 13, 1704. DOI: 10.3390/atmos13101704
- Alaoui, B., Bari, D. & Ghabbar, Y. Space Analog's Searching to Improve Deterministic Forecasting Using Analog Ensemble Method Over Morocco, Recent Advancements from Aquifers to Skies in Hydrogeology, Geoecology, and Atmospheric Sciences. DOI : 10.1007/978-3- 031-47079-0