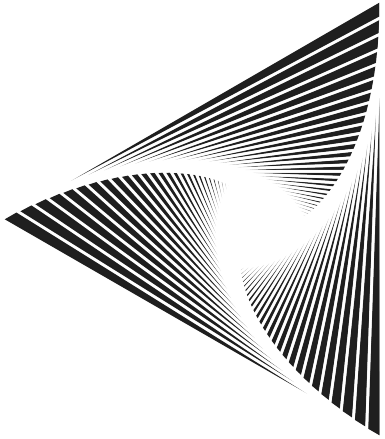


Advanced machine learning solutions for modeling complex systems

www.bvlabs.ai

ICT4Industry, 12 February 2020, Ljubljana

Who are we?

Dr. Dragi Kocev
CEO and co-founder

Dr. Nikola Simidjievski
CTO and co-founder

Dr. Panče Panov
COO and co-founder

… researchers and experts with long-standing experience in designing, developing and applying cutting-edge AI methods for modeling and understanding complex and dynamic systems.

What do we do?

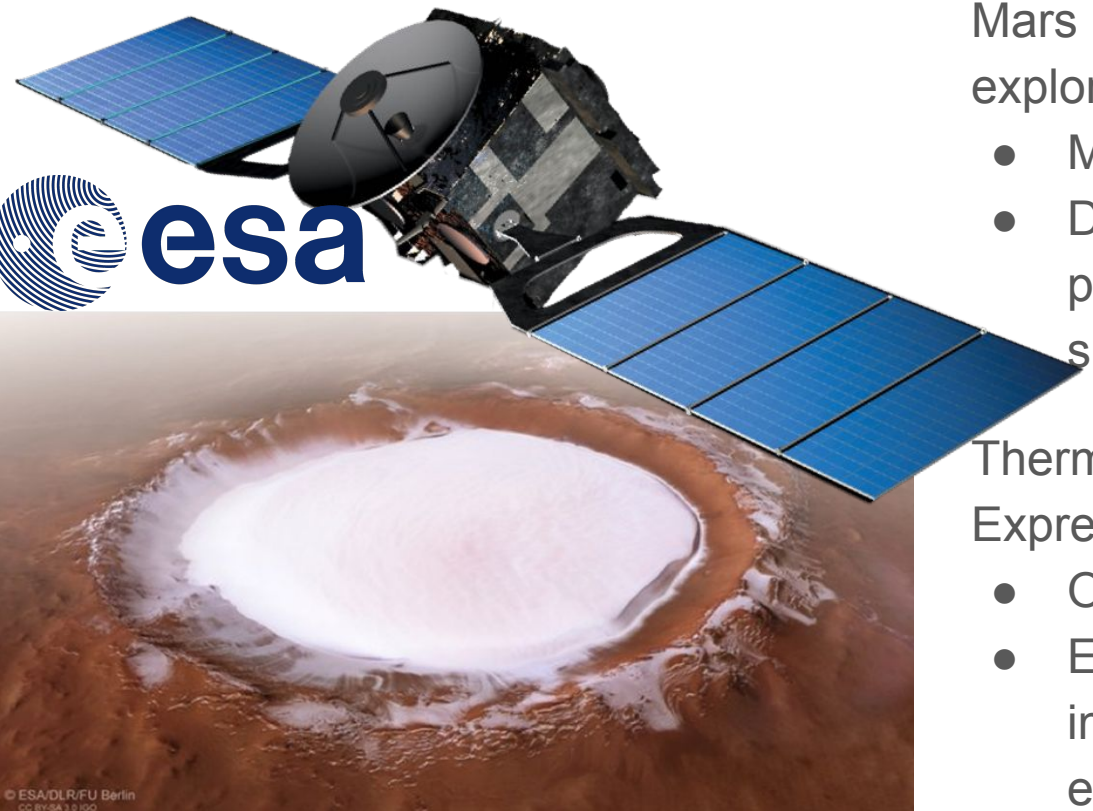
Bias Variance Labs

1. Facilitate the **data-to-discovery** process by focusing on cutting-edge approaches from artificial intelligence and data science.

2. Provide state-of-the-art solutions that address all aspects of the **data life cycle**: data storage, data stewardship, data and knowledge representation, machine learning and visualization.

3. Applications in space research: spacecraft operation and Earth observation.

Data to operations: MEX



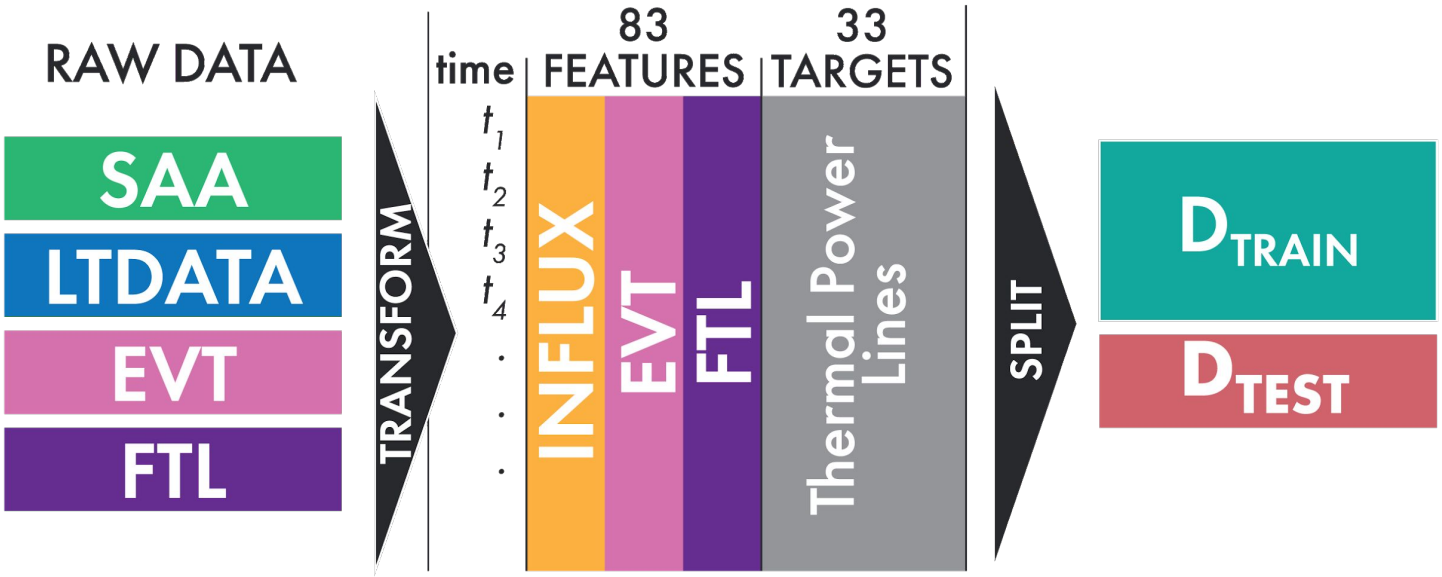
Mars Express (MEX) spacecraft is exploring the planet Mars

- Mapping MARS surface
- Discovery of ice water (2004), ancient planet-wide groundwater system, subglacial lake, methane...

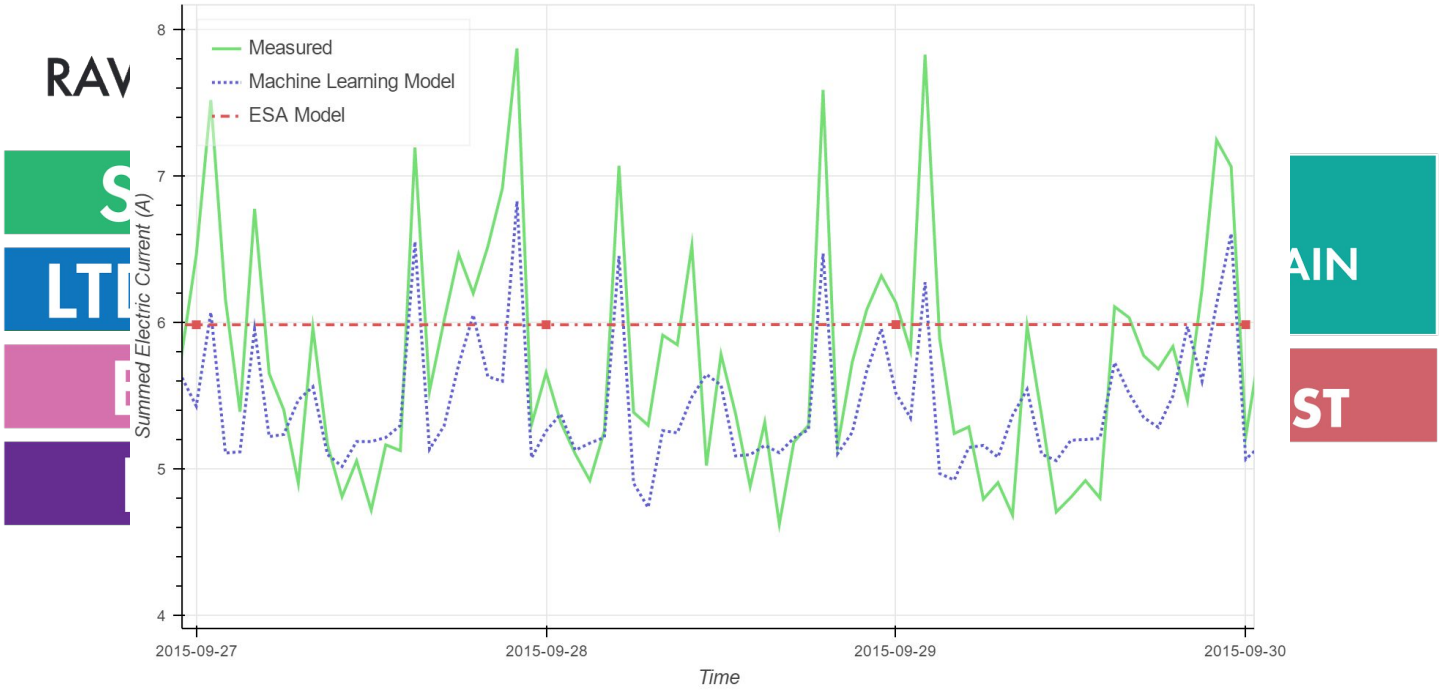
Thermal power consumption of Mars Express spacecraft:

- Old/decaying equipment incl. batteries
- Estimating the thermal consumption improves the science return/spacecraft exploitation

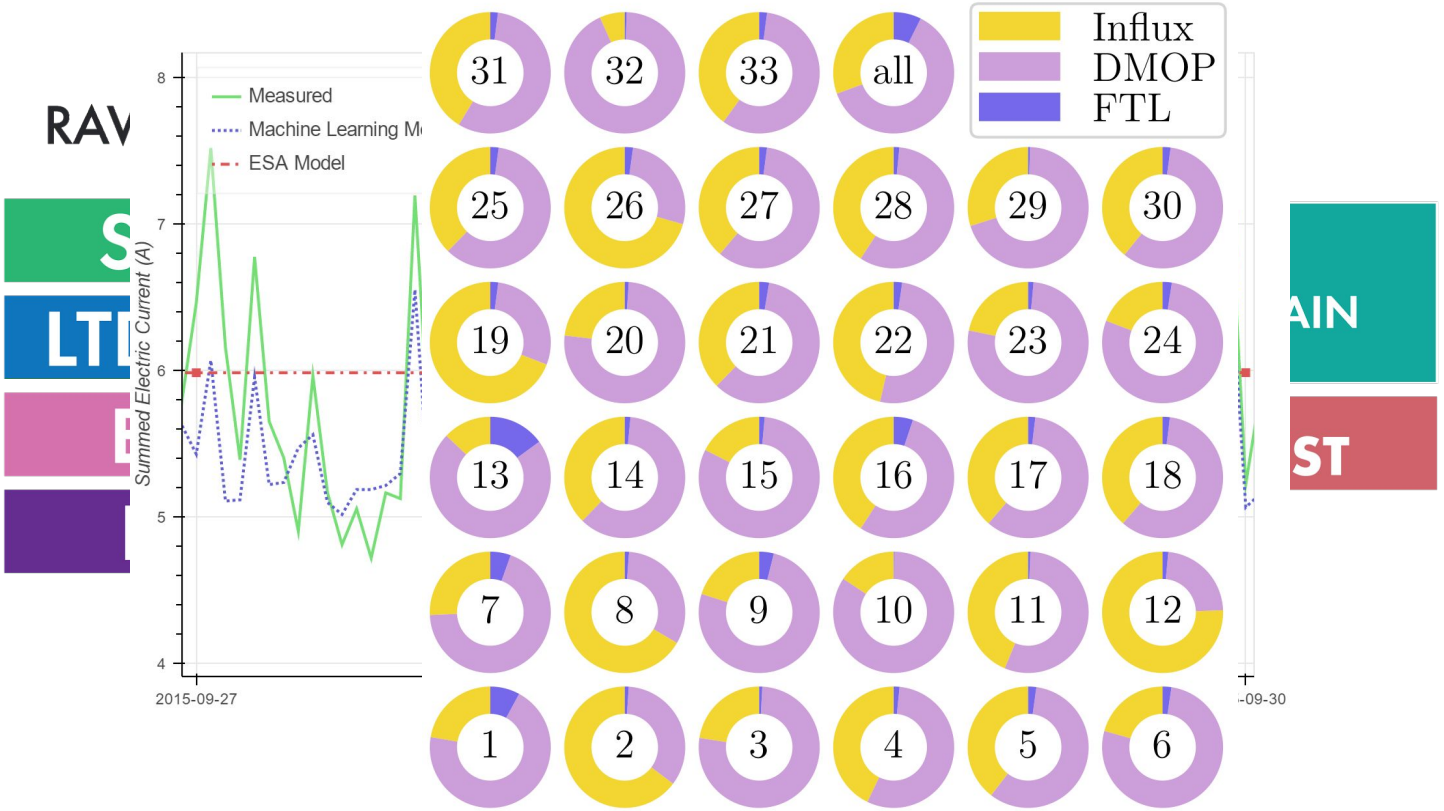
BVL space research efforts: illustrated



BVL space research efforts: illustrated

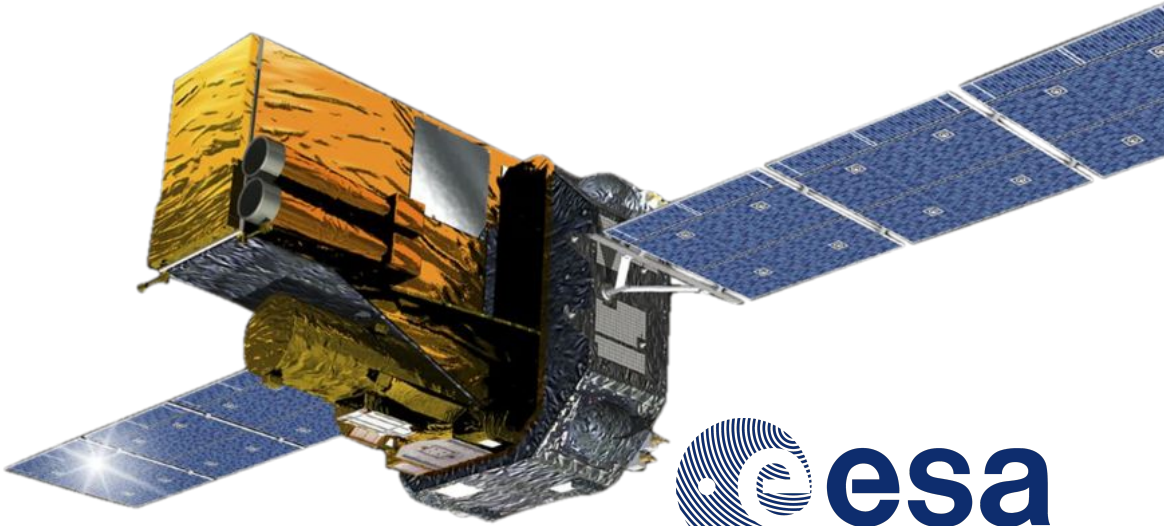


BVL space research efforts: illustrated



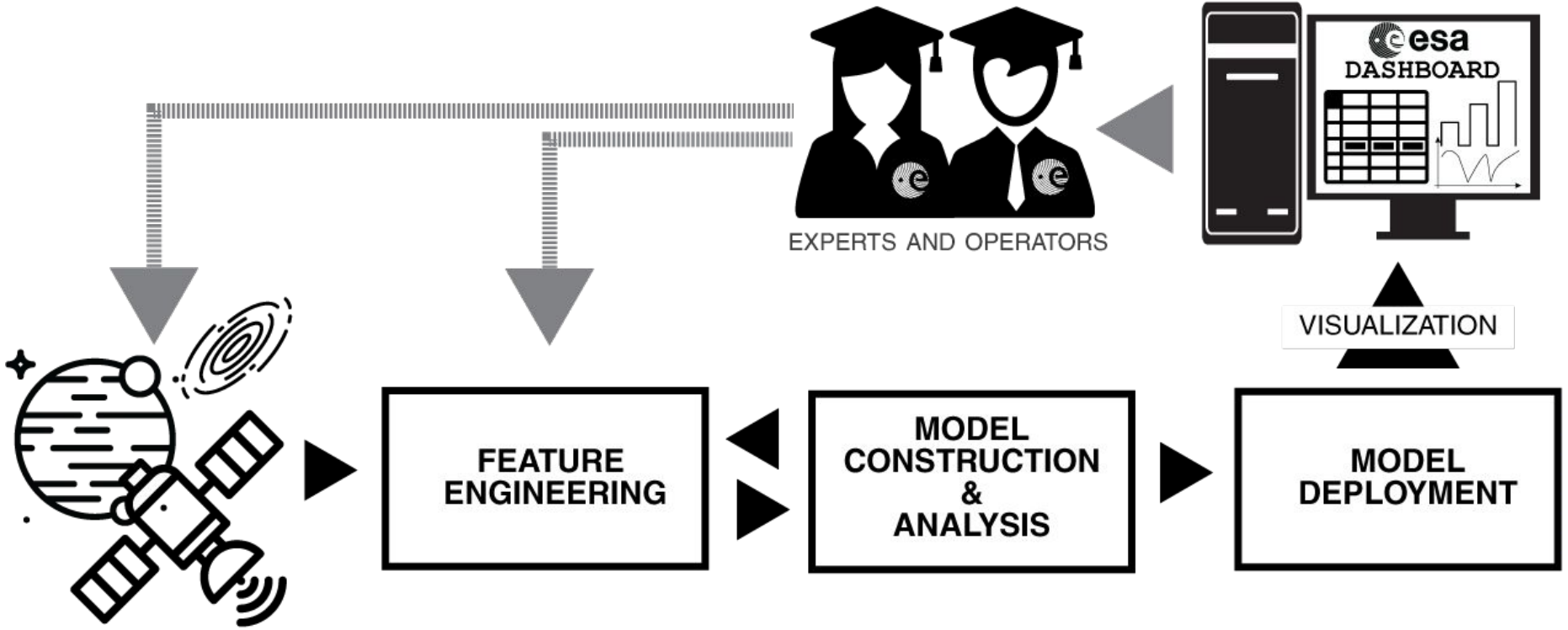
Data to operations: INTEGRAL

INTEGRAL is a space telescope for observing gamma rays with scientific objective of: black holes, neutron stars, active galactic nucleus, supernova, gamma ray bursts, nucleosynthesis, gravitational waves...

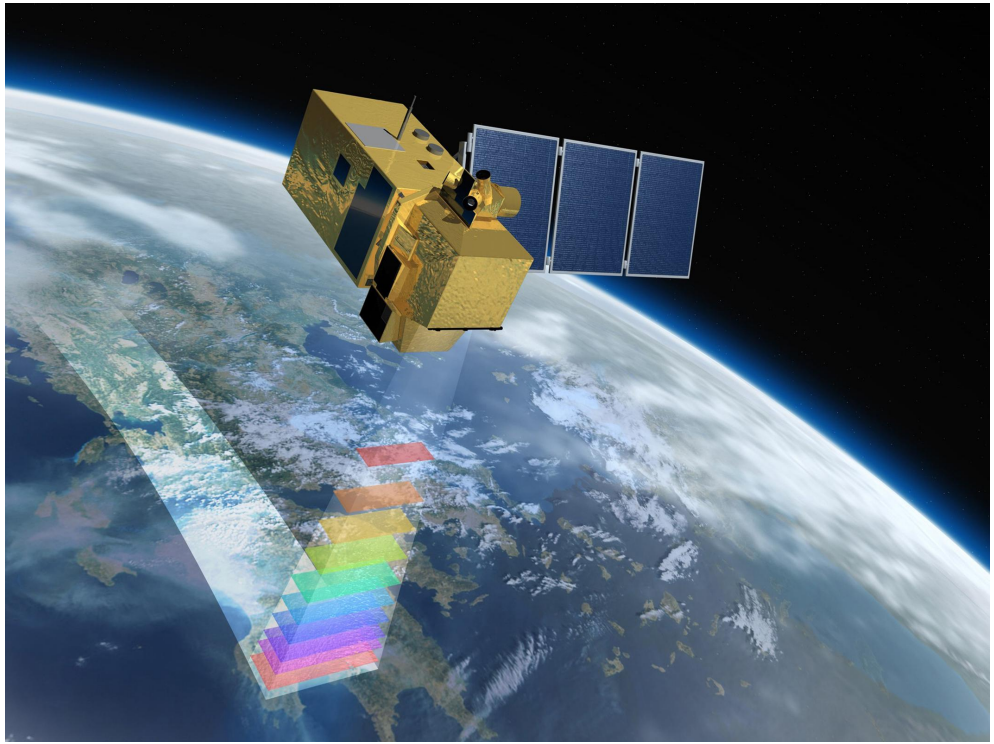


- Orbiting Earth
- Biggest issue is crossing the Van Allen belts
- Due to space weather, difficult to predict the exact position
- Predict entry and exit time of INTEGRAL

ML is an iterative process



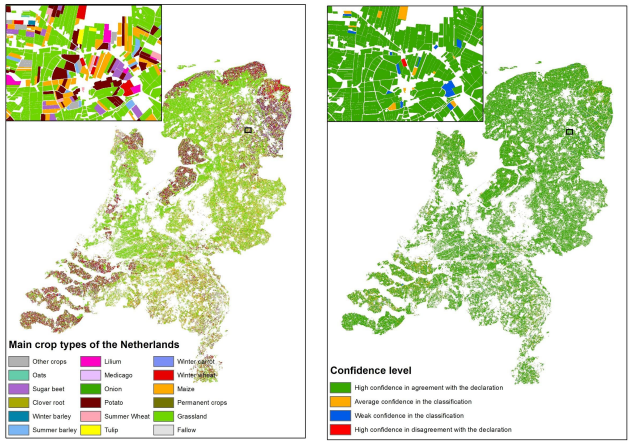
AI4EO prototyping environment: Sentinel missions



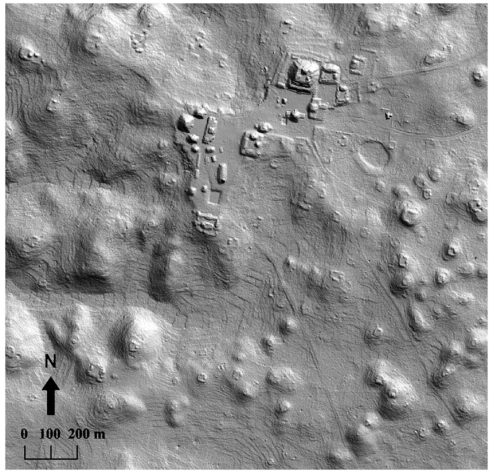
AI toolbox for EO

- Support benchmarking of AI methods used for EO
- Support a variety of deep learning architectures for different case studies
- Consider EO tasks as analysis of complex data

Crop type prediction (Sen4CAP)



Archaeology



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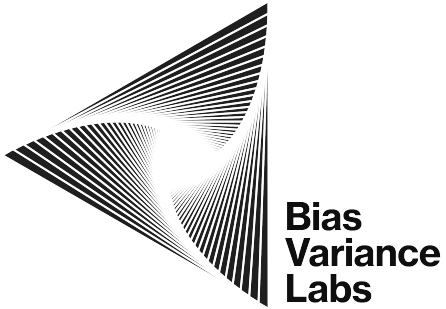

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