

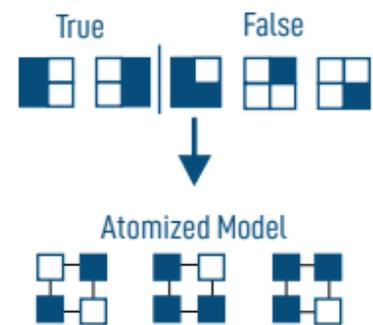


# HUMAN CENTRIC ALGEBRAIC MACHINE LEARNING

The mission of this EU-funded ALMA project is to leverage Algebraic Machine Learning properties to develop a new generation of interactive, human-centric machine learning systems.

## Algebraic Machine Learning as the New Learning Paradigm

AML is a revolutionary new machine learning technique based on algebraic representations of data. AML algorithms are robust regarding the statistical properties of the data and are parameter-free. This form of symbolic AI is capable of learning from data or from formal descriptions or both.



## AML Advantages

Facilitates trust and reliability

Integrates complex ethical constraints into human-artificial intelligence systems

Reduces bias and prevents discrimination.

## Human Centric AI



### User Introspection

Machine decision can be challenged, interpreted, refined and adjusted. Mutual exchange, introspection and active learning of both system and user.



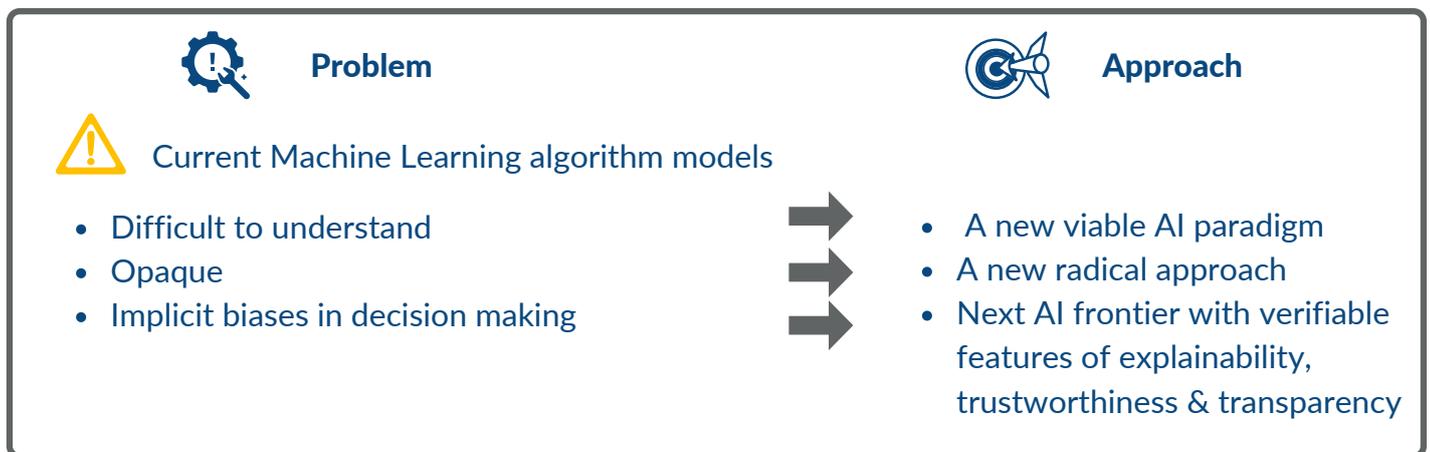
### Machine Learning

Explores models beyond the dominant off-line and centralised data processing. Pursues new avenues, such as incremental, unsupervised, active, one-shot and 'small data' ML.



## Algebraic Machine Learning vs Statistical Learning

Unlike other popular learning algorithms, AML is not a statistical method, but it produces generalizing models from semantic embeddings of data into discrete algebraic structures.



## AML Features

- Is far **less sensitive** to the statistical characteristics of the training data and does not fit (or even use) parameters. It reduces and even avoids overfitting.
- Uses internal representations **based on discrete sets and graphs**, offering a good starting point for generating human understandable descriptions of what, why and how has been learned.
- Has the potential to seamlessly integrate unstructured and complex information contained in training data, with a **formal representation of human knowledge** and requirements
- Can be implemented in a **distributed way** that avoids centralized, privacy-invasive collections of large data sets in favor of a collaboration of many local learners at the level of learned partial representations.

## Consortium

