

D1.3 - Overall Architecture Definition - Revised M36 - Summary

Algebraic Machine Learning (AML) is a novel machine learning technique based on algebraic representations of data. Unlike statistical learning, AML algorithms are robust regarding the statistical properties of the data and are parameter-free. AML systems can retain what they learn, including sociocultural ethical practices for human–artificial intelligence systems. The aim of the EU-funded ALMA project is to study the mathematical properties of AML and to leverage them to develop a new generation of interactive human-centric machine learning systems. These systems are intended to minimize bias in order to facilitate trust while better enabling distributed collaborative learning.

This report corresponds to Deliverable D1.3 - Overall Architecture Definition - Revised M36 of the ALMA project. This deliverable covers the definition of the overall architecture of the AML environment i.e. it covers both the definition of the specification of the AML nodes required for the complete user execution of the AML algorithm, and the specification and design of the communications framework used by these nodes to work collaboratively.

First, a general overview of the ALMA Project is presented. It includes a brief illustration of the work package (WP) structure of the project, along with a short description of each WP and its main tasks. The interrelations between all packages and tasks are emphasized during this section.

Second, the AML is introduced to describe the context and underlying assumptions of the deliverable. Then, the description of the AML Description Language (AML-DL) and the design of the AML Integrating Platform (AML-IP) are presented. Both sections are completed with the *Deliverable D3.3 - AML-DL Specification - Revised M36* and *Deliverable D6.3 - AML-IP implementation - Revised M36*.

Moreover, the current state of the AML environment is shown, i.e. the current state of the AML-DL and the integration of the AML nodes in the AML-IP. Main working scenarios of AML-IP are explained to exemplify some possible use cases where AML features stand out, such as the workload distribution, the collaborative learning, the distributed inference or the monitor network state scenario.

Finally, the innovation management plan is included. It shows the procedures to be complied with by the members of the Consortium in the publication of the knowledge generated within the ALMA project.