

D3.9 - AML-DL Consistency Checker - Final

The Algebraic Machine Learning - Description Language (AML-DL) Consistency Checker is a software tool to study the consistency of algebraic semantic embeddings into semilattices. Given a semantic embedding expressed using the AML Description Language, it can determine if the embedding is consistent or not. If the embedding is not consistent the AML-DL Consistency Checker indicates the primary and secondary sources of the inconsistency.

In AML, the user must describe the problem at hand using a set of algebraic order equations and inequations. These equations are referred to as the embedding or the theory, and the solutions of the embedding as the model. If the set of equations has at least one solution then the embedding is said to be consistent. Inconsistent embeddings have no solutions, i.e. they have no representation as semilattice models.

The primary source of inconsistency is a negative duple that cannot be satisfied because it contradicts other duples of the embedding. The AMLDL Consistency Checker will indicate the AML-DL instruction from which said negative duple originates. To help understand how the inconsistency arises, the AML-DL Consistency Checker also shows the AML-DL instructions that produce duples which, collectively or individually, contradict the primary source duple. If the embedding contains more than one inconsistency the AML-DL Consistency Checker will find and display all of them.

In its current form, the AML-DL Consistency Checker is fully functional and in use. It can assess the consistency of hard and complex semantic embeddings such as the ones provided as examples together with the deliverable.