

The ADRIA team contributes to the development of new approaches to knowledge representation, reasoning and decision in Artificial intelligence. The representation and the processing of incomplete, uncertain, imprecise or inconsistent information, as well as preferences, for reasoning, decision and planning are its core concerns.

Formal frameworks

The problems addressed by ADRIA rely on formal tools like:

- Possibility and imprecise probability theories for the treatment of epistemic uncertainty.
- Logical or graphical models for the representation of preferences (VCSP, CP-Nets, GAI-Nets ...).
- Non-monotonic, weighted, or fuzzy logics intended to bypass the inadequacy of classical logical inference at capturing specific features of human reasoning.

Reasoning

Current work deals with:

- The links between (generalized) possibilistic logic, modal logics, multivalued logics and logic programming.
- The revision and the fusion of uncertain and partially conflicting pieces of information coming from multiple sources.
- Commonsense reasoning based on analogical proportions.

Decision

We focus on axiomatic foundations of decision rules in the qualitative setting, as well as logical and computational tools for multicriteria and/or collective decision and planning problems. Their highly combinatorial nature requires the search for tractable subclasses.

Argumentation

We develop formal models of argumentation and their applications to reasoning, explaining decisions, or modeling dialogues (especially for negotiation purposes).

Machine Learning

ADRIA is interested in various aspects of artificial learning (analogy, preference learning, formal concept analysis), and their adaptation to uncertainty frameworks but also to its connection to human learning (à la Piaget).

These methodological works are generally carried out in connection to applications, such as scheduling, diagnosis, risk analysis, optimization and product configuration.

Some applications :

- Nutri-Educ system for human assistance in dietetics
- Data reconciliation in material flow analysis of rare earths
- Production planning and risk management for supply chains
- Management of product configuration

