A dialectics system in which argumentative agents play and arbitrate to reach an agreement.

Maxime MORGE

SMAC/LIFL/USTL
Motivation: a collective and arguable decision-making

**Project:** "Negotiation and Decision in Land Planning" (Region Rhône-Alpes/French ministry of research)

**Observation:** the success of a decision depends on the extent to which people believe it has been reached fairly ⇒ fair effect process, *i.e.* a process to compose the divergent interests and perspectives.

**Problem:** Support deliberation.

Collective decision=
- multi-actors process ⇒ *autonomous agent*
- complex reasoning of actors ⇒ *cognitive agent*
- collaborative process ⇒ *social agent*
- outcome of individual actions ⇒ *framework for interaction*

**Goal:** multiagent formalization of a collective decision-making
Framework for interaction between agents

In order to communicate, agents use an ACL (syntax/semantics/pragmatics).
E.g. FIPA-ACL :

1. **inform**(*p*)

   Feasible preconditions:
   \[ B_1 p \land (\neg B_1 (B_if_2 p \lor U_if_2 p)) \]

   Rational effects:
   \[ B_2 p \]

Speech act theory [Searle69]

Mentalistic approach of collective decision:
- BDI model \( \Rightarrow \neg \text{Goal 1: manage conflicts} \)
- private and subjective semantics \( \Rightarrow \neg \text{Goal 2: reason together} \)
- rigid protocol \( \Rightarrow \neg \text{Goal 3: warrant to reach an agreement} \)
Proposition: DIAL

DIAL: *framework for inter-agent dialogue*

→ **Main goal:** *formalization of a collective decision-making process to compose divergent interests and perspectives*

- *Multiagent argumentation framework, i.e.*
  value-based argumentation logic
  → **Goal 1:** *manage conflicts*

- *System of argumentative agents, i.e.*
  a model of social agent
  → **Goal 2:** *reason together*

- *Dialectics multiagent system, i.e.*
  a formal area in which a referee gathers the arguments and arbitrates
  → **Goal 3:** *warrant to reach an agreement*