Towards a Framework for Law-Compliant Software Requirements

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What are requirements?

- **D, S |= R**

- **Domain Properties**
  - things in the *application domain* that are true whether or not we ever build the proposed system

- **Requirements** (represented as goals)
  - things in the *application domain* that we wish to be made true by delivering the proposed system

- **Specification** (set of functions/tasks)
  - is a description of the behaviours *the program* must have in order to meet the requirements
Motivation

- New laws, increased pervasiveness of IS
- Laws are increasingly source of requirements
- However law prescriptions are NOT stakeholders goals
  - Stakeholders *want* goals, whereas law prescriptions are *imposed to* stakeholders
  - Law prescriptions can contradict goals
Problem statement

- $D, R \models L$

- **Intentional compliance:**
  - Laws give certain prescriptions, and stakeholders have the intention to satisfy the prescribed goal
  - Distribution of responsibilities, such that, if every actor fulfils its goals, then the compliance is ensured
  - Compliance is ensured by construction

- Needed: languages for modeling
  - Goals ($i^*$)
  - Laws (Nomos)
Language for goals

- Domain: stakeholders, their goals and their organizational settings
  - Actor have goals and interact with each other to achieve them
- $i^*$ (but any other GORE framework is suitable)
The Nomos framework

Nomos = A language + a method + a set of properties (e.g., intentional compliance)

It allows to

- **Reason** about how requirements are generated (select among alternatives)
- **Check** properties of requirements models wrt. Laws

Framework for *systematically* going from law prescriptions to requirements.

- Nomos: $L \times R \rightarrow R'$
A process for law compliance

Step 1 – Domain characterization
  ◦ (Preliminary gathering of knowledge about the domain, its stakeholders, goals, and existing laws)

Step 2 – Law modeling
  ◦ Legal domain exploration; collection of applicable laws; law modeling using a formal language (Nomos)

Step 3 – Goal modeling
  ◦ Refinement of the law models with the information collected in step 1; matching of law subjects with stakeholders; linking of goals with legal prescriptions
A case study: application on Italian data protection law

Current state of the work: the language, the process, the compliance properties
Thank you