

Report of STSM
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Cost Action IC0801 “Agreement Technologies”

Applicant:

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Italy

Host Institute:

Dr. Axel Polleres
DERI (Digital Enterprise Research Institute)
National University of Ireland, Galway

Period:

July 26th – August 16th 2009

Purpose of the visit

This STMS has been coordinated in order to collaborate both with Axel Polleres' group at DERI and with Philipp Kärger. The main goal was joining our applicative and theoretical know-how to make progress in the following major areas: (i) *Preference modeling languages*, (ii) *Event- and Action-based Policy Languages*, (iii) *Authoritative and scalable semantic web reasoning*

Description of the work and results obtained

During the STSM we identified interesting problems to tackle, fixed the corresponding sets of requirements, and decided a strategy for developing technical solutions.

1) Preference modeling languages

We studied the expressiveness of preference modeling logic programming languages, focussing on partially ordered preferences. We developed a general model of preferences and we sketched encodings of subsets of this problem with the major existing preference approaches (LPODs, Answer Set Optimization, and CP-nets). We concluded that more work will be needed to decide whether some of the existing framework can be satisfactorily exploited or whether a new language is needed.

2) Event- and Action-based Policy Languages

We identified several scenarios where policy based behavior control requires more than access-deny decisions. We completed a requisite analysis and are developing a general framework that evaluates such reactive policies and a methodology to separate between reactive behavior control and classical access/deny-request policies.

3) A formal framework for authoritative and scalable reasoning

By filtering proofs in a way that takes ill-formed and unreliable information into account, one can achieve more reliable and trustworthy inferences and reduce the number of inferred facts at the same time (which results in efficiency improvement). We have started to develop a formal account of this process, grounded in the theory of *annotated programs* by Kifer and Subrahmanian. In doing so, we are generalizing the heuristics adopted in previous works.

Future collaborations

We plan to continue our collaboration to extend and complete the work we started in Galway. Initially we plan to cooperate remotely, then we plan to arrange another STSM between these partners within about one year.

Projected publications/articles resulting or to result from the STSM

For each of the above-mentioned research topics, at least one conference paper and one journal paper are planned.