

Report on the Short-Term Scientific Mission to Australia

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Visitor

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Host

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STSM Description

This STSM to Australia took place from the 24th of March (arrived in Australia on the 26th of March) to the 16th of April (left Australia on the 15th of April). The host institution was NICTA's site in Sydney, with a short visit to NICTA's Canberra site from the 2nd to the 4th of April.

The purpose of the visit was the exchange of ideas, with the intention to launch a research collaboration, between the applicant and the host institution. The visitor presented some of his work in a talk he gave in NICTA Sydney entitled "Preference-based Argumentation". During his short visit to NICTA Canberra the visitor presented another topic of his work that is related to Multi-agent planning. Most of the activity during the STSM was centered around two main topics.

Preferences and Argumentation: Part of the latest work of the visitor concerns a preference-based argumentation framework and its applications to negotiation. In NICTA a lot of work has been done on the closely related formalism of defeasible logic. During the STSM we identified some problems that are common to both preference-based argumentation and defeasible logic. They relate to suboptimal decisions reached by these formalisms if they regarded as decision making mechanisms. It turned out that these problems are resolved in different ways in the two formalisms, and an interesting question is how they relate to each other. This relation may further strength the link between Decision theory and argumenta-

tion, and more generally non-monotonic reasoning.

Moreover, we looked at the issue of generalizing preference-based argumentation (eg. by incorporating non-binary conflict relations) and tackling the resulting reasoning problem with constraint satisfaction and optimization techniques.

Planning and Constraint Satisfaction: We discussed the relation between planning and constraint satisfaction. We identified common structures in both problems that may allow for the exchange of ideas and techniques between the two areas. More specifically, it seems that there are some commonalities between work on global grammar constraints, a subarea of constraint satisfaction in which NICTA's Sydney group has worked extensively, and propositional planning. An initial investigation of their relation showed that there is a strong link between the two areas.

All the above activities fall within the interests of the *Algorithmic Decision Theory* COST Action, and more specifically the relation of Decision Theory to subfields within Computer Science such as Artificial Intelligence and Constraint Programming.

We plan to continue our collaboration on the problems of mutual interest that were identified during the STSM, and present possible results in joint publications.