Ascribing Intensional Ontologies in Anthropologically-Based Cultural Descriptions of Multi-Agent Systems

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We have been dealing with what we have called *migration of agents*. The basic idea is that some agents should be able to interact in societies of agents whose designs are based on different paradigms or theories of agents, or which have different histories of autonomous evolution. Providing agents that can learn to interact with unfamiliar communities not only allows interoperation of disparate Multi-Agent Systems (MAS) without the need of standardisation on models and languages of agents but also brings to light several issues of interest in the disciplines that form the foundations of MAS.

In (Bordini & Campbell 1995), we have suggested that Social Anthropology should be among the disciplines of interest to MAS if we are to consider the above way of promoting interoperation of MAS. In particular, we propose the use of Cognitive Anthropology (Tyler 1969) as a theoretical foundation for the project. We have introduced the idea that some agents should be able to produce anthropologically-based formal descriptions of the *artificial cultures* present in all sorts of MAS, which could then be used by *migrating agents* in their processes of adaptation to a target society. There are several aspects of a society that ought to be included in any formal description of theories of agency; we concentrate here particularly on how an *anthropologist agent* can create descriptions of the meaning of individual expressions used in the communication language of the society being described, which is essential for proper communication among native and immigrant agents. For this particular point in *cultural descriptions* of MAS, we have proposed the use of a previous study on a formal, pragmatic theory of intensionality (Vieira & da Rocha Costa 1993), based on R.M. Martin's ideas (1959). We call *Intensional Ontologies* the outcome of our approach to ontology in which term meanings are represented intensionally and subjectively according to how the agents of a community use their language. This approach also allows for an anthropologist agent to ascribe such an ontology to a MAS based on interviews with a group of native *informant agents*, somewhat in the way a social anthropologist proceeds in fieldwork practice.

We have argued its superiority in principle to the KQML[1] approach to interoperability, and to ontology in particular, for a specific sort of MAS which relies on complex aspects of social and cognitive sciences, very much in the fashion of Conte & Castelfranchi (1995). In our view, this approach is also important for the topic of believable agents, regarding adaptation capabilities. Further, our work implies use of several fields of social sciences which have been neglected so far despite their relevance to Distributed Artificial Intelligence (e.g., social anthropology, ethnolinguistics). It is interesting to note that both theories that inspired the works mentioned here (on anthropology and the philosophy of language) follow a formalising approach to social sciences, which is no longer in vogue there. Nevertheless, we suggest that it is worth reviving and making further investigation of fairly old works in social science as sources of inspiration for the more recent, computational counterpart problems in DAI, where the formal aspect is essential.[2]

References

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[1] URL: `http://www.cs.umbc.edu/kqml/`

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