

# *EASSS'09 Tutorial Proposal*

Title: Trust and reputation in multiagent systems

Tutors: Jordi Sabater-Mir (IIIA-CSIC, Spain) and Laurent Vercouter (ENSMSE, France)

## A. Duration

4 hours

## B. Intended Audience

The course is intended for those people that, working in the area of autonomous agents and multiagent systems, want to get a wide perspective on computational trust and reputations models. After the course, the participants should have a general perspective on the state of the art in this field and which are the current problems and research objectives.

## C. Outline

The tutorial will be mainly composed of two parts. The first part presents the general motivations and problems tackled by trust and reputation models. The second part consists in a state of the art of the existing works in the field of trust and reputation in multiagent systems. We also will present in detail a few trust and reputation models that use different approaches to the problem (i.e. a game theoretical approach and a cognitive approach).

### *C1. Motivations and Definitions for Trust and Reputation in MultiAgent Systems (1 hour)*

The tutorial begins with an introduction of the general motivations of trust in multiagent systems. The typical problems tackled by trust and reputation model are presented. We show that they are different problems that the ones tackled by security techniques and that security and trust must be considered as complementary approaches.

The foundations of trust models are then explained. Starting from sociological studies, we identify the main concepts involved in trust models. Clear definitions of concepts such as trust, image, reputation, recommendation, ... are given using the typology proposed by L. Mui (2002), the functional ontology of reputation proposed by S. Casare (2005) and the work of Conte and Paolucci (2002).

### *C2. Computational Trust and Reputation Models (3 hours)*

A survey of the main reputation models is presented. This survey starts from simple models based on a central repository of feedbacks as the ones used in ecommerce web site such as ebay or OnSale and the Sporas and Histos models (Zacharia et al.). Reputation models that include an automatic decision process are then described (models from AbdulRahman et al. and from Marsh). At last, the most elaborated models that implement a complete automatic evaluation and reasoning process are presented: the models proposed by Sen et al., by Schillo et al., by Wang et al., the Liar model proposed by Muller et al. the Regret model

proposed by Sabater and Sierra and the RePage model proposed by Paolucci, Sabater and Conte.

At the end of this first part of the tutorial, we present the current challenges that future research in the field of trust and reputation should aim.

#### D. Background knowledge required

There is no background knowledge required for this course. General notions about multiagent systems will help but are not essential to the global understanding.

#### E. Status of this course

A tutorial on this topic has been given at EASSS'07 by Jordi Sabater-Mir and Laurent Vercouter and at EASSS'08 by Guillaume Muller and Laurent Vercouter. This tutorial will be an improved version of the EASSS'07 and EASSS'08 tutorial based on the students' feedback during the summer school.

#### F. Selected publications of presenters in relation to the topic of the tutorial:

[Pinyol et al, 09] Pinyol, I. Sabater-Mir, J. "Pragmatic-Strategic Reputation-Based Decisions in BDI Agents", AAMAS-09, in-press.

[Lorini et al, 09] Emiliano Lorini, Andreas Herzig, Jomi F. Hübner, Laurent Vercouter. "A logic of trust and reputation". Logic Journal of the IGPL, Oxford University Press, 2009 (in-press).

[Vercouter et al, 07] L. Vercouter, S. Casare, J. Sichman and A. Brandao. "An experience on reputation models interoperability based on a functional ontology", 20th International Joint Conference on Artificial Intelligence (IJCAI'07), Hyderabad, India.

[Conte et al, 08] Rosaria Conte, Mario Paolucci, and Jordi Sabater-Mir. Reputation for innovating social networks. *Advances in Complex Systems*, 11(2):303–320, 2008.

[Sabater et al, 07] J. Sabater-Mir and M. Paolucci. On representation and aggregation of social evaluations in computational trust and reputation models *International Journal of Approximate Reasoning*, 46 (3) :458-483

[Grizard et al, 06] A. Grizard, L. Vercouter, T. Stratulat and G. Muller. "A peertopeer normative system to achieve social order" AAMAS06 Workshop on Coordination, Organization, Institutions and Norms in agent systems (COIN'06), Hakodate, Japan.

#### G. Biography of presenters

Dr. Jordi Sabater-Mir is a tenured scientist at the Artificial Intelligence Research Institute (IIIA-CSIC). He holds a BSc in Computer Science, a Masters degree in Artificial Intelligence and a doctorate in Artificial Intelligence. After finishing his PhD at the IIIA-CSIC he was for two years a postdoctoral Marie Curie fellow at the Institute of Cognitive Sciences and Technologies (ISTC-CNR) in Rome. His current research is focused on computational models of trust and reputation, social network analysis, agent based social simulation (normative systems), development of cognitive agents and electronic institutions. Jordi Sabater-Mir was the main researcher at the IIIA-CSIC for the European project eRep (CIT5-028575-STP), a STREP project about the use of reputation in e-governance that finished March 2009. Currently is participating in several projects (both national and European) where reputation mechanisms have an important role. He has published in international journals and first line conferences about the topic.

Dr. Laurent Vercouter is an assistant professor and a member of the multiagent systems research department at the Ecole des Mines of SaintEtienne in France. The global research theme of L. Vercouter is decentralized multiagent systems and more specifically trust and reputation in MAS. In this field he developed in collaboration with Guillaume Muller a reputation model for the detection and exclusion of liars in P2P systems and published several papers internationally. In 2006, he worked as an invited researcher at the University of Sao Paulo on ontological aspects of reputation. He is involved in the national project ForTrust about the formalization of trust for multiagent systems.

#### H. Contact Information :

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