The 'UvA Rescue C2003'-team description

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Introduction After participating in the Soccer Competition since 1998, the University of Amsterdam extends this year its interest in 'Rescue Simulation League'. The 'C' in our teamname stands for 'Communication', because the core of our approach is to reduce the communication for multiagent coordination[1]. The core of this approach is the introduction of communication teams with an information manager.

Common Knowledge The agents in the same team tend to know the same things about the world, which means some form of common knowledge is introduced. Because of this they can cooperate without communication. We will make this clear with an example of two ambulance agents. Assume that somewhere on the map there is a badly injured civilian that needs to be rescued as soon as possible. Say, this civilian is discovered and there are several ambulance agents nearby. Because the agents are nearby to a mutual point, chances are that they belong to the same communication team. Agents belonging to the same team will largely have the same information of the local situation, we will call this a problem model. On the basis of these (almost) equivalent problem models they are able to make a reliable prediction of the behavior of the other agents in their team. The coordination is based on common knowledge and social convention. This knowledge cannot only be useful for avoiding redundant actions, but also allow the agents to predict whether it is useful to help nearby agents with their task. Because in general it holds that different agents in the same area tend to have the same problem model, this will also work to some extend for heterogeneous agents by way of exchange of information between the different centers. A police agent can predict whether or not a nearby fire agent will be traveling a certain road which possibly needs to be deblocked.

Conclusion We have introduced teams of agents that give priority of exchanging information with teammates. Based on these shared information they predict the behaviors of their teammates, which will lead to cooperation without explicit communication of their objectives. Inside a team we assigning the role of information manager to one of the members, who is responsible for giving summaries of the local model to the center.

[1] S.Post, M. Fassaert, A. Visser "Reducing the communication for multiagent coordination in the RoboCupRescue Simulator", Accepted for the 7th RoboCup International Symposium, Padua, Italy, 10-11 July 2 003.