

Interaction-Centric Coordination

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1 Coordination by Conversation

1.1 Questions

1.1.1 What are the hidden hypothesis of coordination by messages like in this scenario?

In the previous section of the lecture, we studied agent-dimension based coordination. Here, the messages are sent by the agents between themselves. There is no 'main/master' agent to decide the skill/work to be distributed. Instead, the agents can communicate between themselves to reach goals.

1.1.2 Discuss the pros and cons of this approach versus the agent-centric coordination approach.

A good thing is that the agent is much more intelligent and independent as it can decide where/how to work on the basis of the communication-coordination between the other agents. Although, there is no defined protocol on how to communicate between.

1.1.3 What is missing in the description of coordination by messages? Why?

An implementation of a common predecided protocol to coordinate the communication between agents is missing.

1.2 Management of delay for performing a task

1.2.1 Deduce the semantic of the performatives tell, achieve, and askOne, and define when they should be used.

After carrying out Q3, when you use the 'tell' method, the sender will make that the receiver will add the content of the message sent into its belief base. For example, after sending `.send(giacomo, tell, delay(plumbing,10))`, when you go to the Jason HTTP server, you find the giacomo agent having a belief base added with its source `delay(plumbing,10)[source(agenttest)]`.

In Q4, we use the 'achieve' method, where the receiver agent will add the content of the message as a goal 'to acheive'. After carrying out the *.send(giacomo, achieve, updateTolerance(10)).* message in agenttest REPL agent, the goal *!updateTolerance(10)[source(agenttest)]* will be added. Moreover, as there is no existing plan to achieve this goal, we will have a message for the same in our giacomo console.

In Q5, when we use the 'askOne' method, the sender agent wishes to know and confirm if there is something like that is present in the receiver agent's belief base by specifying the method and arguments. After carrying out, *send(giacomo, askOne, penalty(X,Y)).* we wish to know the penalty method of the receiver agent if there is one. In response, we get *penalty(plumbing,50)[source(giacomo)].* in the agenttest's belief base.

Thus, we can conclude that the semantics of the performatives for the methods are completely different.

2 Protocol Definition

2.1 Questions

2.1.1 What are the pros and cons of coordination with protocol?

It is good that any external agent can join the multi agent system if they were following the same protocol. You can add a lot of agents without making the system complicated as there is no main agent like agent-centric. It can be considered as a bittorrent network of agents who are following a particular torrent protocol. A con can be that there is no multithreading in between the agents while communicating. A particular agent can not communicate with different agents at the instance.