Cooperative Agents in Smart Cities

This second assignment is about contracting. Due date is 2021-02-07.

Just like in the previous assignment, you will be using the MASSIM environment of https://multiagentcontest.org/2018/ for providing cooperative solutions by your agent team.

- Implement your version of the Contract Net Protocol (CNP). Whether you choose the simple or the iterative form of the CNP is up to you.
- Implement your version of the extended Contract Net Protocol (eCNP).
- Define a reasonable use case within the smart city domain for both interaction protocols.
- Implement the use cases within MASSIM and carry out some experiments.

Notes and Hints

- The application of CNP is task *assignment*, whereas eCNP is typically used for task *reassignment*.
- If you consider concurrency (as well as the management of multiple parallel eCNP instances) to be too hard to handle, you may introduce some significant changes to "your version" of the eCNP. You are allowed to do any simplifications, as long as very idea of task reassignment is not violated.
- It might be useful to also implement a baseline (such as delegation (to be beaten by your approach) or a combinatorial algorithm for calculating the optimal solution (to be approximated by your approach)).
- There will be a temporal overlap with the last assignment.

Deliverables

All deliverables are to be uploaded or made available via links to the ISIS course page (assignment 2).

Short paper

- Describe the scenario, challenges and your approach. Justify the utilization of your interaction protocols.
- Describe your design decisions, in particular with respect to possible deviations from the

original interaction protocol specifications.
- Describe your experiments.
- Evaluate and analyze your experiments.
- Draw some conclusions and give an outlook.

Code base

- Make available our code base to the trainer.

Simulation videos

- Prepare a simulation video for each use case.
- Augment the videos with explanations.

Schedule for this assignment

- Jan. 13 - appointment via zoom. Hand in a slideset and present your project outline to the class (approx. 10 minutes, not graded): Scenario, challenges, experiments.
- Feb. 07 - due date for short paper, code, and simulation videos. Upload / make available your contributions to the ISIS course page (into assignment 2).