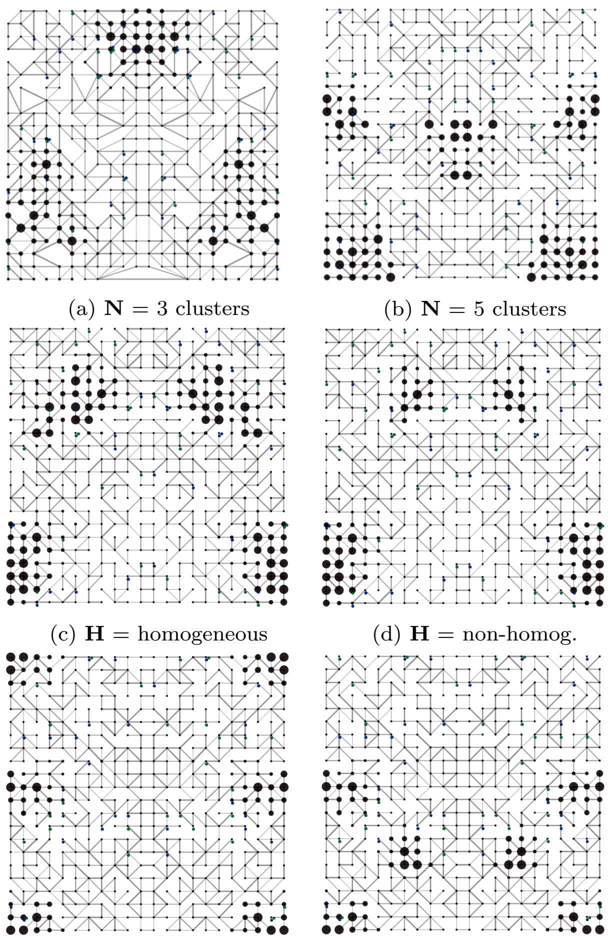
erative heterogeneous agents and the design of an **OS** for a rational team of these agents. The notion of **OS** in this work is based on Moise organizational modeling language [3], where an organizational specification **OS = (SS, FS, DS)** is decomposed in three dimensions. The Structural Specification (**SS**) defines the roles and the groups. The Functional Specification (**FS**) defines as the overall objectives are broken down into goals and missions. The Deontic Specification (**DS**) relates these two dimensions, identifying subsets of missions and goals in **FS** that are permitted and/or required for each role in **SS**.



(a) **N** = 3 clusters (b) **N** = 5 clusters

(c) **H** = homogeneous (d) **H** = non-homog.

(e) **D** = dispersed (f) **D** = non-dispersed

Figure 1: Environments with different patterns.

4. EXPERIMENTAL EVALUATION

The goal of our experiments was to evaluate the impact of the **EP**s over teams' performance, and measuring the performance of two adversary teams composed by the same BDI agents, but with two different **OS**s.

Considering teams' **OS**s, we have fixed the attribute values associated with the **FS** and **DS**, and have just modified the number of squads and the cardinality of each squad in the **SS**. Hence, the experiments consisted of seven different teams that competed each against other for 10 times, using 14 environments with different **EP**s. Each team is composed of a different number of groups called *squads* which are in charge of occupying the best possible clusters they can find in the map [2].

We used the *Wilcoxon T* test as a hypothesis test to define for each match if the 10 simulations were sufficient or not to conclude that a team was better than other in a determined environment.

Regarding **N**, the team must have a number of squads equal or closer to the number of clusters on the map. If the number of squads is smaller than the number of clusters, the team will not cover all good areas, which can then be easily occupied by the opponent.

For **H**, the experiments showed that occupying the clusters with highest values is critical in non-homogeneous environments since the winner ends up by being the team that occupies the bigger clusters. This favours teams with small number of squads, since they can occupy the best clusters, while an opponent with a larger number of squads ends up by spreading its agents in smaller clusters.

Finally, regarding **D**, the results showed that less dispersed clusters help teams with a larger number of squads to form larger areas than they could if the clusters (and the agents) were dispersed.

5. CONCLUSIONS AND FURTHER WORK

Although our results are preliminary ones, we believe that they provide at least two contributions that can be exploited in the design of agents' teams when the task environment is hard, but can be described in terms of **EP**s.

The first contribution is related to the knowledge the designer can learn about these task environments, to assess whether a team will be able to selectively search for solutions. The second one is related to the proper notion of **EP** realized in this work. Considering it as a complementary representation of the state of the environment, and the consistent knowledge that can be provided by a more intensive evaluation of the impact of **EP**s over teams' performance, we believe that two possibilities are generated for the designer (that may be a team agent): (1) to predict the behavior of a team if he knows its goals, its **OS**, and the current **EP**s; (2) to define a team behaviour by designing a suitable **OS** if he knows the current **EP** and team's goal. These are hypotheses that we hope to prove in the near future.

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