Agents develop independent alignments which can be compared with their peers the correspondences that they found. Roughly, three modalities can be compared: We want first to understand when this occurs as well as what can be done for the agents to share different agents, in the same population, do not necessarily end up with the same alignments. It is expected that interacting with agents of another population. Games will have to be designed for agents to locally adapt alignments between their ontology and the one used by other populations. This proposal focuses on the behavior of populations of agents. Its goal is to study how agents in a population, sharing the same ontology, can take advantage of what is learnt by the others agents and observing the consequences. These problems may be approached either theoretically or experimentally, through the framework of experimental cultural evolution. Experimental cultural evolution provides a population of agents with interaction games that are played randomly. In reaction to the outcome of such games, agents adapt their knowledge. It is possible to test hypotheses by precisely crafting the rules used by agents in games and observing the consequences. The work will be carried out in the MOEx team common to INRIA & LIG. MOEx is dedicated to study knowledge evolution through adaptation. It gather permanent researchers from the Exmo team which has taken an active part these past 15 years in the development of the semantic web and more specifically ontology matching. Our ambition is to adapt the successful cultural language evolution approach [Steels, 2012] to the evolution of the way agents represent knowledge [Euzenat, 2014; Amslow & Rovatsos, 2015; Chocron & Schorlemmer, 2016]. We have applied this approach to ontology alignment repair, i.e., the improvement of incorrect alignments [Euzenat, 2014; 2017]. For that purpose, we performed a series of experiments in which agents react to mistakes in ontology alignments —expressing relations across ontology concepts [Euzenat & Shvaiko, 2013]. Agents only know about their ontologies and alignments with others and they act in a fully decentralized way. We showed that cultural repair is able to converge towards successful communication through improving the objective correctness of alignments. This proposal focuses on the behavior of populations of agents. Its goal is to study how agents in a population, sharing the same ontology, can take advantage of what is learnt by the others agents interacting with agents of another population. Games will have to be designed for agents to locally adapt alignments between their ontology and the one used by other populations. It is expected that different agents, in the same population, do not necessarily end up with the same alignments. We want first to understand when this occurs as well as what can be done for the agents to share with their peers the correspondences that they found. Roughly, three modalities can be compared:

- Agents develop independent alignments which can be compared;
- Agents develop independent alignments, but from time to time, proceed to synchronisation when they exchange their findings (this synchronisation, in turn, may be global to the population or local to a pair of agents);
- Agents develop from the beginning shared alignments.

In the two latter modalities, different operations may be used to aggregate the results brought by other agents.

Finally, it is possible to consider more than two populations and/or ontologies, eventually by splitting and merging populations and to study its impact on the alignment process.

**Skills**

- Curiosity and openness.
- Interaction with other researchers.
- Autonomous researcher.
- Taste for experimentation.
- Knowledge of multi-agent simulation and/or logic not required but a plus.
- Innovative.

**Bibliography**


**Benefits package**

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

**Remuneration**


Monthly salary after taxes : around 1596,05€ for 1st and 2nd year. 1678,99€ for 3rd year. (medical insurance included).