SECTOR: Higher Education Institution

LOCATION: France, Grenoble

RESEARCHER PROFILE:

□ First stage researcher,

INSTITUTION: Univ. Grenoble Alpes, University of Innovation

One of the major research-intensive French universities, Univ. Grenoble Alpes\(^1\) enjoys an international reputation in many scientific fields, as confirmed by international rankings. It benefits from the implementation of major European instruments (ESRF, ILL, EMBL, IRAM, EMFL\(^*)\). The dynamic ecosystem, grounded on a close interaction between research, education and companies, has earned Grenoble to be ranked as the 5th most innovative city in the world. Surrounded by mountains, the campus benefits from a natural environment and a high quality of life and work environment. With 7000 foreign students and the annual visit of more than 8000 researchers from all over the world, Univ. Grenoble Alps is an internationally engaged university.

A personalized Welcome Center for international students, PhDs and researchers facilitates your arrival and installation.

In 2016, Univ. Grenoble Alpes was labeled «Initiative of Excellence". This label aims at the emergence of around ten French world class research universities. By joining Univ. Grenoble Alpes, you have the opportunity to conduct world-class research, and to contribute to the social and economic challenges of the 21st century ("sustainable planet and society", "health, well-being and technology", "understanding and supporting innovation: culture, technology, organizations" “Digital technology”).

\(^*\) ESRF (European Synchrotron Radiation Facility), ILL (Institut Laue-Langevin), IRAM (International Institute for Radio Astronomy), EMBL (European Molecular Biology Laboratory), EMFL (European Magnetic Field Laboratory)

Key figures:

- + 50,000 students including 7,000 international students
- 3,700 PhD students, 45% international
- 5,500 faculty members
- 180 different nationalities
- 1st city in France where it feels good to study and 5th city where it feels good to work
- ISSO: International Students & Scholars Office affiliated to EURAXESS

\(^1\) https://edu.univ-grenoble-alpes.fr/en/
SUBJECT DESCRIPTION:
By performing tasks, agents acquire knowledge that can be used in other contexts for other tasks. We aim at understanding how several agents performing, collaboratively or competitively, different tasks for achieving different goals, may acquire better knowledge.

Cultural knowledge evolution deals with the evolution of knowledge representation in a group of agents. For that purpose, cooperating agents adapt their knowledge to the situations they are exposed to and the feedback they receive from others. This framework has been considered in the context of evolving natural languages [Steels, 2012]; We have applied it to ontology alignment repair, i.e. the improvement of incorrect alignments [Euzenat, 2014; 2017]. We have shown that cultural repair is able to converge towards successful communication through improving the objective knowledge quality.

In most of the work so far, agents are designed for dealing with one single task. Hence, their knowledge is shaped for this particular task. However, pursuing several goals at once, and performing different tasks to that end, would benefit from developing non-specialised (multi-purpose) knowledge. It is expected that agents developing such knowledge would have more facility to address different tasks.

On the other side of the spectrum, we may consider societies of complementary and very specialised agents. This includes the competition of several agents able to perform the same specific task. Such societies are more specifically considered by economic approaches, in particular game theory.

As an example, one may consider agents pursuing different goals for subsisting: being fed and in good health. This involves various tasks such as growing food, producing medicine and providing care. In turns, this involves other tasks such as extracting matters, moving matter, manufacturing medicine, moving manufactured products such as food and medicine, training nurses, etc. To achieve their goals, all agents may be a gardener, a cook, a nurse, a nurse trainer and a transporter. Skills developed for transporting people, may be reused for transporting food and vice-versa, knowledge developed for training gardeners, may be reused for training pharmacists. However, in other societies agents may specialise into gardening, caring or teaching and the bests at each task may be selected in a competitive market.

This thesis proposal thus considers two different dimensions together: on the one hand, whether agents are expected to perform one or several tasks; on the other hand, whether they work collaboratively, independently or competitively.

We consider cultural knowledge evolution in such a context with the aim to understand the impact of such an organisation on the knowledge developed by each agent and by the society as a whole. Knowledge may be considered under the light of its contribution to reaching the agents' goals or for its own value, such as its correctness and completeness. Knowledge may also be measured at the level of the society. For instance, one may want to measure the degree at which the wealth is shared. In addition, we want to assess are the differential benefits of each approach: this may be short-term efficiency or long-term resilience.

These problems may be treated both theoretically or experimentally.

This work is part of an ambitious program towards what we call cultural knowledge evolution partly funded by the MIAI Knowledge communication and evolution chair.

References:


Links:
- MIAI Knowledge communication and evolution: https://moex.inria.fr/cooperation/miai/
- mOeX web site: https://moex.inria.fr
- Lazy lavender: http://lazylav.gforge.inria.fr

ELIGIBILITY CRITERIA
Applicants must hold a Master's degree (or be about to earn one) or have a university degree equivalent to a European Master's (5-year duration),

Applicants will have to send an application letter in English and attach:
- Their last diploma
- Their CV
- A short presentation of their scientific project (2 to 3 pages max)
- Eventually their master thesis, marks or any relevant documents
- Letters of recommendation are welcome.

Address to send their application: Jerome.Euzenat@inria.fr