Knowledge re-combination and invention as key features for commonsense reasoning and computational creativity research

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Dynamic conceptual reframing represents a crucial mechanism employed by humans, and partially by other animal species, to generate novel knowledge used to solve complex goals.
In this talk, I will present a reasoning framework for knowledge invention and creative problem solving exploiting TCL: a non-monotonic extension of a Description Logic (DL) of typicality able to combine prototypical (commonsense) descriptions of concepts in a human-like fashion [1].
The proposed approach has been tested both in the task of goal-driven concept invention [2,3] and has additionally applied within the context of serendipity-based recommendation systems [4]. I will present the obtained results, the lessons learned and the road ahead of this research path.

References

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[2] Antonio Lieto, Federico Perrone, Gian Luca Pozzato and Eleonora Chiodino "Beyond Subgoaling: A Dynamic Knowledge Generation Framework for Creative Problem Solving in Cognitive Architectures", *Cognitive Systems Research*, 58, 305-316, 2019.

[3] Eleonora Chiodino, Antonio Lieto, Federico Perrone, Gian Luca Pozzato "A goal-oriented framework for knowledge invention and creative problem solving in cognitive architectures", in *Proceedings of ECAI 2020*, 24th European Conference on Artificial Intelligence, 2020.

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