A 3rd person Knowledge Level analysis of cognitive architectures

Abstract
I provide a knowledge level analysis of the main representational and reasoning problems affecting the cognitive architectures for what concerns this issue. In providing this analysis I will show, by considering some of the main cognitive architectures currently available (e.g. SOAR, ACT-R, CLARION), how one of the main problems of such architectures is represented by the fact that their knowledge representation and processing mechanisms are not sufficiently constrained with "structural insights" (Lieto 2021) coming from cognitive science for dealing with commonsense knowledge and reasoning (Lebiere, Oltramari, 2018). As a possible way out to such knowledge processing issues, I present the main assumptions that have led to the development of the Dual PECCS categorization system (Lieto, Radicioni, Rho 2017) and discuss some of the lessons learned and their possible implications in the design of the knowledge modules and knowledge-processing mechanisms of integrated cognitive architectures.

Bio
Antonio Lieto is a researcher at the Department of Computer Science of the University of Turin and a research associate at the ICAR-CNR. His research revolves around the following (partially overlapping) themes: commonsense reasoning, cognitive systems and architectures, language technologies. He is currently (2017-2022) Vice-President of the Italian Cognitive Science Society. In 2013 he founded the international workshop series AIC (Artificial Intelligence and Cognition, http://www.aicworkshopseries.org/) and, since 2015, he is a member of the IEEE technical committee on Cognitive Robotics. In February 2020 he has been appointed ACM Distinguished Speaker by the ACM for the topics of cognitively inspired AI and artificial models of cognition.

References

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