Description Logic Meets Coalition Logic
On Concepts, Agents, and Strategies

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Coalition Logic (CL) is one of the most important formalisms for specification and verification of game-like properties in multi-agent systems. Here, we propose a game description logic which is based on a product of CL with the description logic ALC. The new logic allows one to reason about agents' ability to influence first-order structures. We also show that the satisfiability problem for the logic is decidable.

The remarkable thing is that the logic does not really allow to express exciting properties, despite all the nontrivial semantic machinery that combines reasoning about concepts with reasoning about agents. However, when we add names of individuals to the language (which is technically simple), the properties that we can specify become much more interesting. Which suggests that the practical usability of a language may depend on elements that seem rather minor from the theoretical point of view.