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TITLE: Seeing is Believing: Formalising False-Belief Tasks in Dynamic Epistemic Logic

In my talk I will show how false-belief tasks like the Sally-Anne Task and the second-order Chocolate Task can be formalised in (an extension of) Dynamic Epistemic Logic (DEL). False-belief tasks are used to test the strength of the Theory of Mind (ToM) of humans, that is, a human's ability to attribute mental states to other agents. Having a ToM is known to be essential to human social intelligence, and hence likely to be essential to social intelligence of artificial agents as well. It is therefore important to find ways of implementing a ToM in artificial agents, and to show that such agents can then solve false-belief tasks. In my the talk, the approach is to use DEL as a formal framework for representing ToM, and use reasoning in DEL to solve false-belief tasks. In addition to formalising several false-belief tasks in DEL, the paper introduces some extensions of DEL itself: edge-conditioned event models and observability propositions. These extensions are introduced to provide better formalisations of the false-belief tasks, but expected to have independent future interest.