▶ GAIA BELARDINELLI, AND THOMAS BOLANDER, *Attention! Dynamic Epistemic Logic models of (in)attentive agents.*
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Attention is the crucial cognitive ability that limits and selects what information we observe. Previous work by Bolander et al. [1] proposes a model of attention based on dynamic epistemic logic (DEL) where agents are either fully attentive or not attentive at all. While introducing the realistic feature that inattentive agents believe nothing happens, the model does not represent the most essential aspect of attention: its selectivity. Here, we propose a generalization that allows for paying attention to subsets of atomic formulas. We introduce the corresponding logic for propositional attention, and show its axiomatization to be sound and complete. We then extend the framework to account for inattentive agents that, instead of assuming nothing happens, may default to a specific truth-value of what they failed to attend to (a sort of prior concerning the unattended atoms). This feature allows for a more cognitively plausible representation of the inattentional blindness phenomenon, where agents end up with false beliefs due to their failure to attend to conspicuous but unexpected events. We prove the extended logic to be sound and complete as well. Both versions of the model define attention-based learning through appropriate DEL event models based on a few and clear edge principles. While the size of such event models grow exponentially both with the number of agents and the number of atoms, we introduce a new logical language for describing event models syntactically and show that using this language our event models can be represented linearly in the number of agents and atoms. Furthermore, representing our event models using this language is achieved by a straightforward formalisation of the aforementioned edge principles.

The full paper is available here: `https://arxiv.org/abs/2303.13494`

[1] Thomas Bolander, Hans van Ditmarsch, Andreas Herzig, Emiliano Lorini, Pere Pardo, and François Schwarzentruber, *Announcements to Attentive Agents*, **Journal of Logic, Language and Information**, vol. 25 (2016), pp. 1–35.