Refining Intentional Modals via Topology

Aybüke Özgün

University of Amsterdam

This talks provides an overview of two applications of topological semantics in philosophical logic: (1) topological semantics for epistemic logic based on possible worlds and (2) topological semantics for modeling topic-sensitive (binary) intentional modals based on an algebra of topics.

The first part of this talk will be concerned with modal logics for evidence, knowledge, and belief. The traditional treatment of epistemic logics based on relational semantics is not rich enough to talk about the evidential nature of acquired knowledge and belief. I will argue that topological spaces emerge naturally as information structures if one not only seeks an easy way of modeling knowledge and belief, but also aims at representing evidence and its relationship to these notions. Based on the semantics proposed in [1], I will show that the topological approach enables fine-grained and refined representations of the aforementioned epistemic notions, highlighting several variations and extensions in the literature. (This part of the talk is based on joint work with Alexandru Baltag, Nick Bezhanishvili, and Sonja Smets).

In the second part of the talk, I will focus on logics of imagination, which formalize the notion of imagination via a binary, topic-sensitive modal operator. In the topic-sensitive theory of the logic of imagination, the topic of the imaginative output must be contained within the topic of the imaginative input. That is, imaginative episodes can never expand what they are about. This constraint is implausible from a psychological point of view, and it wrongly predicts the falsehood of true reports of imagination. I will present a number of direct approaches to relaxing this controversial topic-inclusion constraint. The core idea involves adding an expansion operator to the algebra of topics. The logic that results depends on the formal constraints placed on topic expansion, the choice of which are subject to philosophical dispute. The first semantics I will present is a topological one using a closure operator. I will also explore a few weaker topic expansion operators and their associated logics. Time permitting, I will elaborate on further generalizations of the topic-sensitive semantics of imagination and the applications of proposed topic expansion operators to knowledge, belief, and conditionals. (This part of the talk is based on joint work with Aaron J. Cotnoir)

References

[1] Baltag, A., Bezhanishvili, N., Özgün, A., and Smets Justified belief, knowledge, and the topology of evidence. Synthese 200, 512 (2022). https://doi.org/10.1007/s11229-022-03967-6