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Yabloesque Paradoxes and Modal Logic

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Abstract

To counter a general belief that all the paradoxes stem from a kind of circularity (or involve some self–reference, or use a diagonal argument) Stephen Yablo designed a liar-like paradox in 1993 that seemingly avoided self–reference. Since then much debate has been sparked in the philosophical community as to whether Yablo's Paradox is really circular–free or involves some circularity (at least hidden or implicitly). Unlike the liar paradox, which uses a single sentence, this paradox applies an infinite sequence of statements, each of which refers to the truth values of the later statements in the sequence. There is no consistent way to assign truth values to all the statements, although no statement directly refers to itself.

In this talk, we give a modal logic formalization of Yablo's paradox and turn Yablo's paradox into a genuine mathematical theorem in Linear Temporal Logic (LTL) as well as in modal logic. Furthermore, we introduce a Yabloesque non-self-referential paradox in epistemic game theory which shows that modeling of players' epistemic beliefs and assumptions in a complete way is impossible. Our goal in this talk is also to take more formal analysis and to study this non-self-referential paradox from the modal logic point of view.

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