Type: Article in Journal

Author: Ma, Minghui
Pietarinen, Ahti-Veikko

Title: Gamma graph calculi for modal logics

Year: 2018

Journal: Synthese

Volume: 195

Issue: 8

Pages: 3621–3650

Keywords: Existential Graph, Gamma Graph, Modal logic, Epistemic Logic

Abstract: We describe Peirce’s 1903 system of modal gamma graphs, its transformation rules of inference, and the interpretation of the broken-cut modal operator. We show that Peirce proposed the normality rule in his gamma system. We then show how various normal modal logics arise from Peirce’s assumptions concerning the broken-cut notation. By developing an algebraic semantics we establish the completeness of fifteen modal logics of gamma graphs. We show that, besides logical necessity and possibility, Peirce proposed an epistemic interpretation of the broken-cut modality, and that he was led to analyze constructions of knowledge in the style of epistemic logic.

Language: English