

- LEONARDO PACHECO, *Epistemic possibility in Artemov and Protopopescu's intuitionistic epistemic logic*.

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Epistemic logics formalize knowledge and related concepts. Artemov and Protopopescu [1] defined an epistemic logic IEL to formalize intuitionistic knowledge. The central idea of this logic is that intuitionistic truth implies intuitionistic knowledge. This heavily contrasts with the classical case, where classical knowledge implies classical truth.

The modality K is interpreted in IEL as

$$K\varphi \text{ holds iff it is intuitionistically known that } \varphi,$$

for all formula φ . IEL satisfies the principles of co-reflection $\varphi \rightarrow K\varphi$ and weak reflection $K\varphi \rightarrow \neg\neg\varphi$. Note that, in a classical setting, these imply that truth and knowledge coincide.

We extend IEL with a modality \hat{K} for epistemic possibility. To do so, we use the semantics of diamonds in constructive modal logics [2]. We will show that, for all formula φ , $\hat{K}P$ is equivalent to $\neg\neg P$. This implies that φ is epistemically possible iff it one can show that it is impossible to prove the negation of φ .

Note that there are other intuitionistic approaches to epistemic logic in the literature. For a brief survey, see Section 6 of [1]. As far as the author is aware, epistemic possibility has not been studied in other intuitionistic approaches to epistemic logic. For more details, see [3].

[1] SERGEI ARTEMOV and TUDOR PROTOPOPESCU, *Intuitionistic epistemic logic*, **The Review of Symbolic Logic**, vol. 9, no. 2 (2016), pp. 266–298.

[2] MICHAEL MENDLER and VALERIA DE PAIVA, *Constructive CK for contexts*, **Context Representation and Reasoning**, vol. 13 (2005).

[3] LEONARDO PACHECO, *Epistemic possibility in Artemov and Protopopescu's intuitionistic epistemic logic*, **RIMS Kôkyûroku**, no. 2293, pp. 66–71 (2024).