▶ FRANCESCA DONEDA, GIUSEPPE PRIMIERO, FRANCESCO A. GENCO, *A many-valued proof-theoretical system for assessing the trustworthiness of information sources.*
Department of Philosophy, University of Milan, Via Festa del Perdono 7, Milan, Italy.
E-mail: francesca.doneda@unimi.it, giuseppe.primiero@unimi.it, francesco.genco@unimi.it.

We introduce a graded proof-theoretical system for evaluating trustworthiness among information sources acting under uncertainty. In contexts such as expert debates, with uncertain and constantly updated information, the ground truth is often yet unavailable or undetermined, which makes it impossible to check claims. From these considerations emerges the need to introduce models capable of defining trustworthiness measure on information sources as a useful proxy for establishing their contents' truthfulness. This may represent a helpful tool for laypeople to navigate experts' debates.

We build on a first version presented in [2] which uses the proof theory and relational semantics from [1] to model an information exchange system (a platform where agents can read and write messages) designed for trustworthiness ranking generation. The system relies on a semantic interpretation of positive and negative trustworthiness assessment of messages and several parameters, including fact-checking. To capture the dimension of uncertainty, fundamental in the context of any debate, we now extend this model with a proof theory based on a many-valued logic. This extension significantly increases the expressivity of the model as it allows to evaluate the trustworthiness of a source taking into account the probability to read certain information and its influence on the dynamics involved in its distribution and in the decision to trust it or not. We also offer some basic correspondence results with non-probabilistic calculi.

Keywords. Trust, probabilistic computation, trustworthiness, uncertainty, many-valued logic.

[1] G. Primiero. A logic of negative trust. *Journal of Applied Non-Classical Logics*, 0(0):1–30, 2020.

[2] G. Primiero, D. Ceolin, and F. Doneda. A computational model for assessing experts' trustworthiness. *Journal of Experimental & Theoretical Artificial Intelligence*, 0(0):1–32, 2023.