

# Rethinking legal probabilism

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## 1 Scientific goal

As many miscarriages of justice indicate, scientific evidence is easily misinterpreted in court. This happens mostly because of the communication gap between the parties involved. For this reason, methods are needed to support proper assessment of evidence in such contexts. The assessment of evidence in the court of law can be viewed from at least three perspectives: as an interplay of arguments, as an assessment of probabilities involved, or as an interaction of competing narrations. Each perspective has been developed into a full-blown account of legal reasoning (Di Bello & Verheij, 2018; van Eemeren & Verheij, 2017). While individually each of these strains has been investigated, exploration of the relations between them is in a rather early stage. Crucially, the criticism of the probabilistic approach present in the literature have not been satisfactorily adressed by the proponents of legal probablism.

The **goal of this project** is to contribute to the **development of legal probabilism** by formulating its variant that accomodates important **insights provided by its critics**. A crucial point of criticism is that the fact-finding process should be conceptualized as **a competition of narrations**. I plan to develop methods that allow the probabilist to take this perspective, and explain how such methods allow the legal probabilist to address various other objections present in the literature. The key idea is that once **narrations are represented as bayesian networks, various criteria on, features of and operations on narrations can be explicated in terms of corresponding properties of and operations on bayesian networks**. The conceptual developments are accompanied by technical accounts. **R** code capturing to the technical features developed is made available to the reader. Thus, the output will be a **unifying extended probabilistic model embracing key aspects of the narrative and argumentative approaches, susceptible to AI implementation**. The methods employed include: Bayesian statistical methods (including Bayesian approach to higher-order probability), imprecise probabilities and Bayesian networks.

## 2 Significance

(state of the art, justification for tackling a specific scientific problem, justification for the pioneering nature of the project, the impact of the project results on the development of the research field and scientific discipline);

## 3 Concept and work plan

(general work plan, specific research goals, results of preliminary research, risk analysis);

## 4 Research methodology

(underlying scientific methodology, methods, techniques and research tools, methods of results analysis, equipment and devices to be used in research);

## References

Di Bello, M., & Verheij, B. (2018). Evidential reasoning. In *Handbook of legal reasoning and argumentation* (pp. 447–493). Springer.

van Eemeren, F., & Verheij, B. (2017). Argumentation theory in formal and computational perspective. *IFCoLog Journal of Logics and Their Applications*, 4(8), 2099–2181.