Book Review


Introduction

Research on Artificial Intelligence (AI) and Law began to flourish in the eighties. AI and Law is a hype, especially in The Netherlands. It started with the Ph.D. Thesis "Logical Tools for Modelling Legal Argument" of Henry Prakken (1993). For many researchers, this thesis seemed to be an inspiration for their own research and they often referred to this work. This is easily demonstrated by the large number of dissertations in the AI and Law field that were published after Prakken’s thesis: Smith (1994); Van Kralingen (1995); Visser (1995); Den Haan (1996); Royakkers (1996); Verheij (1996); Van der Torre (1997); De Vey Mestdagh (1997); Leenes (1998); and Lodder (1998). All these dissertations roughly deal with the theme of the possibilities of mechanising legal reasoning.

Interest in the field of AI and Law is not surprising if we take into account the development of nonmonotonic logics, which really took off after the early eighties. The restriction of classical logic was felt in the AI field. An important objection was that knowledge representation is “commonsense reasoning,” which cannot directly be represented by classical logic due to its monotonic nature (i.e., if a conclusion follows from a set of premises, then that conclusion also follows when extra premises are added). In daily life, people seldom express themselves in a truly formal way. Human reasoning often contains steps that have a certain degree of uncertainty, as the information available is not always complete, reliable or consistent. Evidently, these problems also occur in legal reasoning.

The Argentinians Carlos E. Alchourrón and Eugenio Bulygin, who became famous with their fundamental work Normative Systems (1971), hit upon the fact that legal systems had severe drawbacks concerning accuracy which cannot be dealt with in classical logic. This opinion rings throughout their view regarding inconsistency (1981):

It is interesting to observe that lawyers (not contaminated by philosophy) readily accept the possibility of contradictions in law. This is shown by the fact that there are old, traditional principles designed to solve such conflicts. The principles lex posterior, lex superior and lex specialis would have no application at all if there were no inconsistencies in legal dispositions. The very fact that lawyers often resort to such principles shows at least that they believe that normative contradictions are quite possible. (…) But it would be a mistake to regard the rules of preference (traditional or not) as logical rules (p. 114)

and by Bulygin regarding incompleteness (1976):

Covering the gaps in the law (supplements to law) is an important problem in practice. Jurists make use of a whole battery of rules that function as argumentation rules: the argumentum a

fortiori, analogy reasoning, the a contrario argument, etc. It is important to realise that none of these rules is a valid conclusion rule. Valid conclusions can only be drawn if silently accepted premises are taken into account. With purely logical tools we cannot fill the gaps of an incomplete legal system (p. 621).

Alchourrón and Bulygin are of the opinion that these problems can be solved “only with the help of modern logic.” Nonmonotonic reasoning methods can be valuable tools to fill the gaps of an incomplete or inconsistent legal system. The advantage of these methods is that they can infer tentative (and logically unsound) conclusions that have to be withdrawn when new facts contradict them. Furthermore, the methods can be used in reasoning by default; if there is no indication to the contrary, an assumption is made for the time being, since this holds “almost always” (common-sense reasoning).

In the book *Logical Tools for Modelling Legal Argument: A Study of Defeasible Reasoning in Law*, Prakken shows how nonmonotonic reasoning methods have made it possible to give a logical analysis of two aspects of legal reasoning: defeasible reasoning and reasoning with inconsistent information, which cannot be dealt with in classical logic. In this book review, I shall discuss Prakken’s book, which is a revised and extended version of his Ph.D. Thesis. First, I will give a summary of the book, and then I shall add some critical notes.

The Content

In Chapter 1, the aim of the research is explained and an outline is given of the points of departure for the research. One important point of departure is formulated during the discussion of what AI is.

[T]here are, roughly, two kinds of AI research, distinguished by their aims: some researchers try to let computer systems perform like intelligent human beings, while others restrict themselves to more practical aims. (…) this book chooses for aims which are close to the practical side of the scale; when it comes to AI, it is not about logical aspects of making really intelligent artificial judges or solicitors but about logical aspects of legal knowledge-based systems: of systems of which a main feature is the separation of knowledge and ways of using it (p. 5).

The aim of the research is as follows:

[T]he aim of the present investigations is to give a logical analysis of two aspects of legal reasoning which are sometimes held to escape such an analysis: reasoning with defeasible information and reasoning with inconsistent information. (…) [T]he relevance of the present study may be expected to exceed the legal domain, since I shall focus on issues which have also appeared in the general debate on the role of logic in AI (p. 8).

Furthermore, the author gives an overview of the discussion in the literature about the role of logic in AI research. This results in two conclusions, which are relevant for his book:

[I]t is impossible to make a sharp distinction between procedural and declarative or even between logical and nonlogical knowledge representation language: knowledge representation formalisms have both procedural and declarative aspects, and the importance of logic lies in its ability to analyze the declarative aspects.

and

[B]oth in case of nondeductive types of reasoning and in case of inconsistent knowledge logic can be useful: what is essential is that logic should be regarded as a tool in a larger framework, which is called reasoning; using logic to represent domain knowledge does not commit at all to a particular way of modelling reasoning: in particular, it does not commit to regarding reasoning as no more than mechanically deriving consequences from a set of logical formulas (p. 12).

In Chapter 2, the author starts by removing four misunderstandings about the nature of logic in reasoning in general. The most persistent misunderstanding concerns “the criticism that using logical methods would imply a commitment to some naive, simplistic view on how to do justice”