



## Unit 6

### Legal Reasoning, Cognitive Science, Artificial Intelligence

#### SELECTED READINGS

The titles in this bibliography provide an introduction to the sub-field of artificial intelligence and legal reasoning. There are three broad themes distinguished in this reading list: cognitive science and legal reasoning, legal reasoning and AI (defeasible, case-based, rule-based approaches), and reasoning with and about AI systems in law. There is a mix of introductory and more advanced texts that should lead the reader into the world of AI and law. The first theme looks at human reasoning from cognitive perspective and investigates whether the specialised reasoning as observed in legal settings has a potential to be computational. The second theme delves deeper in the different approaches to modelling legal reasoning, these include logic-based approaches, argumentation, reasoning by analogy and rule-based reasoning. The third theme provides insights in the current research on AI assisted legal technology and how such technology is used and perceived by legal actors.

#### TOPIC 1: COGNITIVE SCIENCE AND LEGAL REASONING

1. Miller T., "Explanation in Artificial Intelligence: Insights from the Social Sciences", *Artificial Intelligence*, 267, 2019: 1-38.
2. Stenning K., Van Lambalgen M., *Human Reasoning and Cognitive Science*, The MIT Press, 2012.
3. Blasi G.L., "What Lawyers Know: Lawyering Expertise, Cognitive Science, and the Functions of Theory", *Journal of Legal Education*, 45, 1995: 313.
4. Gowder P., "Is Legal Cognition Computational? (When will Deep Vehicle replace Judge Hercules?)". In Whalen R. (ed), *Computational Legal Studies*, Edward Elgar Publishing, 2020.

#### TOPIC 2: LEGAL REASONING AND AI

There is a longstanding tradition of legal reasoning and AI. It includes modelling legal reasoning based on precedent cases and rules.

#### Literature suggestions:

6. Prakken H., Sartor G., "A Dialectical Model of Assessing Conflicting Arguments in Legal Reasoning". In Id., *Logical Models of Legal Argumentation*, Springer: 175-211.
7. Sartor G., *A Treatise of Legal Philosophy and General Jurisprudence. Volume 5: Legal Reasoning. A Cognitive Approach to the Law*, ed. by E. Pattaro, Springer, 2005.
8. N. MacCormick, *Legal Reasoning and Legal Theory*, Clarendon Press, 1978.
9. Wróblewski J., *The Judicial Application of Law*, Springer, 1992.
10. Raz J., *Practical Reason and Norms*, Oxford University Press, 1975.
11. Bongiovanni G., Postema G., Rotolo A., Sartor G., Valentini C., Walton D., *Handbook of Legal Reasoning and Argumentation*, Springer, 2018.

#### Defeasible reasoning:

NOTE: Readings on defeasible reasoning can be found under the Unit 5 reading list on Recognise website.

#### See in particular:

(AI literature) J. Pollock, "Defeasible Reasoning" (1987); J. Pollock "Defeasible reasoning with variable degrees of justification" (2001)

(Legal literature) H. Prakken, G. Sartor, “The Three Faces of Defeasibility in the Law” (2004); G. Sartor “Defeasibility in Legal Reasoning” (1995); J. Hage, “Law and Defeasibility” (2005); J. Ferrer Beltrán, G.B. Ratti, “Legal Defeasibility: An Introduction”, in Id. *The Logic of Legal Requirements* (2012).

Case-based reasoning:

12. Ashley K.D., “Case-Based Reasoning and Its Implications for Legal Expert Systems”, *Artificial Intelligence and Law*, 1, 2-3, 1992: 113-208.
13. Watson I., Marir F., “Case-Based Reasoning: A Review”, *Knowledge Engineering Review*, 9, 4, 1994: 327-354.

Rule-based reasoning:

14. Branting L.K., *Reasoning with Rules and Precedents: a Computational Model of Legal Analysis*, Springer Science & Business Media, 2013.
15. Hage J., “Reasoning with Rules”. In Id., *Reasoning with Rules*, Springer, 1997: 78-129.

TOPIC 3: REASONING WITH AND ABOUT AI SYSTEMS IN LAW

Legal analytics, predictions, and research on how such systems are perceived and used by the judges.

16. Ashley K.D., *Artificial Intelligence and Legal Analytics: New Tools for Law Practice in the Digital Age*, Cambridge University Press, 2017.
17. Chouldechova A., “Fair Prediction with Disparate Impact: A Study of Bias in Recidivism Prediction Instruments”, *Big data*, 5, 2, 2017: 153-163.
18. Heise M., “The Past, Present, and Future of Empirical Legal Scholarship: Judicial Decision Making and the New Empiricism” *University of Illinois Law Review*, 2002: 819.
19. Susskind R.E., Susskind D., *The Future of the Professions: How Technology Will Transform the Work of Human Experts*, Oxford University Press, 2015.

TOPIC 4: THE PHILOSOPHY OF ARTIFICIAL INTELLIGENCE

20. Haugeland J. (ed), *Mind Design II: Philosophy, Psychology, Artificial Intelligence*, The MIT Press, 1997.
21. Boden M.A. (ed), *The Philosophy of Artificial Intelligence*, Oxford University Press, 1990.
22. Copeland J., *Artificial intelligence: A philosophical introduction*, John Wiley & Sons, 2015.
23. Bostrom N., *Superintelligence*, Dunod, 2017.