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Book Review

Pamela N. Gray *Artificial Legal Intelligence*, Darmouth, Aldershot, England, 1997, (ISBN 1-85521-266-8)

I had been told by several people that *Artificial Legal Intelligence* by Pamela N. Gray[1] was not that interesting or at best controversial. Indeed, the book is different from what normally is written in the field of AI & Law and belongs to the postmodern deconstructionist literature of the 1980s and 1990s.[2] At first glance it might appear somewhat mystical with chapters named 'Holistic legal intelligence', 'Cyclic paradigms of legal intelligence' and 'Jurisprudential systems: survival jurisprudence', and sections called 'intra-strata and inter-strata choice', 'river logic', and 'virtual reality of legal spheres'. A closer look reveals that underneath the mysterious surface lies a rich, well-documented sea of interesting material. To give just one example, I was pleasantly surprised to find out (p. 221) that my famous fellow country man Johan Huizinga in Chapter IV of *Homo Ludens* deals with lawsuits as games.[3]

The aim of the book can be summarized as follows. Gray identifies two major, interrelated problems of a legal system (p. 7):

- high costs of legal services;
- ever-growing complexity of the law.

A solution to these problems could be that the law is represented in an automatable form (p. 8), and that user-friendly legal services are provided through intelligent software (p. 7–8). In her book Gray seeks to expand (p. 10) the domain of artificial legal intelligence so that it can mature as a technology and as a field of jurisprudence, and she thus takes into account both the technical and the legal side. Not only is technology used to support activities in the legal system, it also might be that the legal system itself may have to adapt to the requirements of the new technology (p. 11). These observations and objectives seem comparable to what is advocated these days by Tom M. van Engers of the University of Amsterdam. They share a background in psychology, but Van Engers moved to Knowledge Management. Gray also has a degree in Philosophy and builds her theory basically on legal history.

1. 1991, 1997, 2004

Artificial Legal Intelligence appeared in 1997. Although there has not been that much progress in AI & Law research since then, 7 years is still a long period. The book seems to be written even longer ago. One of the prefaces is dated 31 March 1995. Also, it would be rather strange if an AI & Law book from the mid nineties with an impressive index of over 3000 entries (p. 361–402) does not contain the term Internet or World-wide web.[4] The book is optimistic about what computers might achieve in law, and advocates a vision that gradually disappeared from the second half of the 1980s onwards. Actually most text seems to be written in the eighties and at the start of the nineties. Because the over 500 references contained in the bibliography are from 1991 or before, except for Austin 1995 which was first published in 1832 and three articles that appeared in *Computers and Law* 1995, e.g., E. Predavec, 'The Automatic Justice Machine?' (p. 72), I guess the book was basically finished in 1991. This assumption is supported by the fact that the historical overview of AI & Law 'abruptly' ends in 1991.

Why is a book from 1991 published in 1997, and reviewed in 2004? I do not know the answer to the first question,[5] but the answer to the second question is that I simply did not read the book earlier than the summer of 2004 *and* that the book is interesting for the audience of *Artificial Intelligence & Law*. Moreover, the book covers a period of more than two thousand years, so being late in reviewing is relative.

2. Emergence of AI & Law

The historical overview in Chapter 2 'Emergence of artificial legal intelligence' provides an excellent, although maybe somewhat uncritical, overview of the history of AI & Law until 1991. I briefly mention some highlights.

Already in 1975 the first legal expert system was made public in the UK in the domain of welfare benefits (p. 31). Even then the integration of office automation and expert systems was apparent. The system determined the eligibility for benefits and produced a letter of advice to the client. Currently similar but more sophisticated systems are amongst the most successful IT applications in the law, e.g., SoftLaw in Australia and MRE in the Netherlands. In the same year a Ph.D thesis by J.A. Meldman appeared (MIT) called *A Preliminary Study in Computer-aided Legal Analyses* (p. 31). Still in 1975, JUDITH, a legal analysis aid suited to the German code was designed by W.G. Popp and B. Schlink (p. 31). In sum, already in 1975 there was a lot of activity in AI & Law.

The director of the just mentioned company SoftLaw worked with David Mead on the BED system (Benefit Eligibility Determiner) in 1984 (p. 34–36).

In 1986 Katsumi Nitta, well-known for his HELIC-papers at several ICAILs in the 1990s, combined PROLOG with an object oriented language to deliver a Patent Law program (p. 54). Hajime Yoshino headed during 1982–1990 three LES (Legal Expert System) projects. The architecture of LES-2 ''incorporated a lawsuit game module which applied procedural law and weighed evidence in a given case.'' (p. 55), what can be considered an application far ahead of his time. The first legal ESPRIT-project *Foundations of Legal Reasoning* started in 1989 (p. 64), and was later reported upon in the Law and Philosophy Series.[6]

3. Believers

In the Netherlands Jaap van den Herik[7] advocates, at least since his 1991 inaugural address *Can computers judge?*, the position that one day computers will sit on the judge's chair. His arguments are mainly based on the advancement of technology. From the moment the chess computer Deep Blue has beaten world champion Kasparov, he also draws a parallel between the now falsified disbelief that this could ever happen and the existing skeptical view on the possibility of judging computers. However, at this moment Van den Herik still does see: technical obstacles, such as modeling common sense reasoning; legal obstacles, such as vague terms and maintenance; and reluctance on the side of the judiciary. In 2080 the computerized judge will be a fact, in his own words (freely translated):[8]

> ''Once in 2005 intelligent computers are connected to the World-wide Web a multi-agent system originates (a network of thinking computers (agents) connected to the Internet). The judging computer is such an agent. He will browse the Internet and retrieve relevant knowledge on norms, values, and opinions and use those in his reasoning process. In 80 years from now the judging computer will like a human judge anticipate developments in society and make justified decisions.''

Pamela N. Gray shares the optimism of Van den Herik:

> ''Choice according to right reason may in fact be automated, so that the work of informed decisionmaking and co-ordinated human autonomy can be done by machines. Justice, reason and human benefit might be compounded in one system of social exchange, a decision making system which implements the exchange, secured by the rules of law.'' (p. 313)

She is cautious by putting it as ''may in fact'', and ''might be''. The ''can be'' in the next cite is more affirmative (p. 195):

> "... paradigms or metaphors for understanding the legal system, and the methods for designing intelligent legal programs, so that a viable and vital legal system can be developed and maintained in the age of science"

What makes the work of Gray interesting is the wealth of literature she bases her theories on, and her fantastic (in all meanings) ideas. I can understand the problems some might have with her work, but no matter the extent to which you dislike her work, you cannot deny that she has a really original mind.

4. History recalls...

Chapter 3 discusses the history of philosophy from the perspective of holistic legal intelligence, which "is a collective intelligence" and "consists of the paradigms which legal experts have, create, use, and pass down through legal practice, education and training" (p. 75). Artificial legal intelligence is concerned with systems of collective human intelligence and systems of collective legal expertise (p. 76). Topics covered are, e.g., rhetoric (p. 87–89), dialectic (p. 100), and ethics (p. 107). I also learned (p. 99–100) that mediators exist for about a millennium, Peter Damian was a mediator who lived from 1007–1072.

For her evolutionary theory of law Gray builds on the work of Lobingier and Schulz. Charles Lobingier (1923) identified five stages in the development of Roman Law of three hundred years each, where a new era represented a new form of law. Fritz Schulz (1967) identified four periods based on a shift in methodology. By merging the two theories Gray marks the following five periods in the evolution of a legal system:

1. The ritualistic stage (equality of parties and unbiased judges);
2. The Common Law stage (social cohesion, secular control);
3. The Theoretical stage (consistency, hierarchy of rules);
4. The Casuistry Stage (case detailing);
5. The Codification stage (simplification and streamlining).

While the focus of Lobingier and Schulz was on Roman Law, Gray analyses (p. 116 – p. 135) both Roman Law (800 B.C – 700 A.D) and English Law (800 A.D. – 2000 A.D). In Gray's analysis each stage in Roman and English law covers a period of 300 years. While the other periods lasted 300 years, and the fifth stage was in fact the last stage in Roman Law, I have no indications that Gray means to say that the coming period will last 300 years or that there will be no English law afterwards. What is important is that

English law is entering the Codification Stage. Gray sees computer codification of legal services: simplification and streamlining suited to automation (p. 136). This codification incorporates a static knowledge of the law (cf. theoretical stage) and the dynamic processing of its application (cf. casuistry stage). The latter was not part of the Roman codification phase, which was static only (p. 5). Note that Gray does not classify the theoretical stage as static, and the casuistry stage as dynamic, but this relation is appealing to me.

5. Choice, technology, and SURMET

In terms of Gray, legal reasoning is a process of moving from one unit of data to the next (p. 168).[9] For a system to work well the substantive units and the choices involved have to be identified. Gray does so in 'Chapter 5 Science of legal choice', where she distinguishes over 15 different types of choices, e.g. systems choice, dialectic choice, relative choice, and knotted choice (p. 137–169).

Technological jurisprudence is the study of science and technology for their application to the legal domain (p. 195) or major paradigms of technology are applied to law (p. 171). In this sixth chapter some basics of science, including an interesting discussion of legal science, and computer hardware and software are discussed. The ethics of user-friedlines concludes the chapter.

The remainder of the book is dedicated to one particular system, a four dimensional model of legal intelligence called SURMET (p. 196–306). This last part was least convincing to me. You can or cannot agree with her somewhat esoteric theories, but they are interesting. When it comes to working out these ideas it becomes clear that the visionary ideas are currently not suited for implementation. It painfully shows that technology is not as far as what was hoped for at the beginning days of AI & Law. It is also in this part that the exclusion of research from beyond 1991 (and, less so, from after 1997) is most problematic, although even in 1991 some lessons were already learned. Nonetheless, her ideas in this final part are still worth taking notice of. Her complex river system of rules, her fan of rivers, and the jurisprudential fishbone[10] are despite their somewhat strange naming at least original ways of representation. In the section 'Spaghetti processing of river logic' she notes that 'the experimental use of hypertext clarified some new design directions' (p. 263). At the assumed moment of writing (1987–1991), she could not have guessed how extremely influential this type of representation would become with the emergence of the Internet.

A last remark concerns her four dimensional model of legal intelligence. The first dimension contain the concepts of law. The second and third

dimension are arrangements of these concepts in such an order that they either favor the proponent in a case or the opponent. The fourth dimension represents legal strategy, equitable discretion, and development of the law. In my opinion, in the fourth dimension the former three dimensions are taken together and the second and third are weighted against each other. Her model seems self evident, but is not that always the case with good ideas? The model is theoretically interesting and in particular with actual implementation in mind. A system as HYPO includes the first three dimensions, systems as The Pleadings Game and DiaLaw only the second and the third dimension. Systems used for practical purposes basically represent the first and fourth dimension (the second and third are not explicitly modeled). It is maybe a system like ESM that represents all four dimensions. The general concept seems adequate. Systems that decide should do so based on substantive law (first dimension), on procedural aspects of law (second, and third dimension), and what seems to be the most difficult task, taking all this into account to deliver an acceptable decision.

6. Closing remarks

Stephen M. McJohn starts his review of Gray's book[11] with:

> "Pamela Gray's *Artificial Legal Intelligence* offers an imaginative, utopian view of the technological implementation of legal reasoning. (...) *Artificial Legal Intelligence* presents a thought-provoking approach to both computational models of legal reasoning and the use of evolutionary thinking about the law. Drawing on a prodigious amount of research, Gray looks beyond the rather technical approach common in the field and attempts to place artificial legal intelligence within the broad structure of legal history."

In the last section McJohn comes to the conclusion that:

> "*Artificial Legal Intelligence* has a powerful vision of the benefits of a perfectly informed, unbiased, and capable legal system. But such an optimistic view of the evolution of law undercuts a greater contribution of artificial intelligence techniques to the study of legal reasoning – the identification of a need for close and skeptical examination of the legal reasoning process."

I would not say that Gray undercuts the more common approach in AI & Law, neither that what others do is a greater contribution.[12] This book is just different. Personally, I believe the book could improve from taking into

account results of AI & Law research that do not justify the view of Pamela Gray. But it would then become a different book, and as it is, the book is certainly worth reading.

Notes

[1] I want to thank Pamela Gray who was so kind to respond to this review.

[2] Cf. e-mail Gray 2004.

[3] The subtitle of my 1998 thesis *DiaLaw* is *On dialog games and legal justification*, and the first chapter starts with the quote 'Justice is a game'.

[4] The index does, however, refer to three pages with the term Cyberspace. The quotes reflect the peculiar way of writing of the author, and her very personal style.
On p. 81: ''Cyberspace technology is now available to represent mind space and the structures and processes of legal intelligence.''
On p. 113: ''Just as Jesus provided better access to God, through his holy spirit, risen from the dead, that defied natural limitations, so computing machines with their supranatural memory, speed of processing, distant communication, and interactive cyberspace, now offer better access to the collective metaphysical intelligence of science''.
On p. 312: ''In cyberspace, we may virtually travel in, and enjoy, universes of alternative four dimensional worlds where we can find the methods of directing avoidance and resolution of conflict.''

[5] Gray (2004, e-mail) told me the book is based on her 1990 Master thesis and actually came out in December 1996. In 1995–1996 work on the index took place.

[6] Z. Bankowski *et al*. (1995)(eds.), *Informatics and the foundations of legal reasoning* (LAPS no. 21), Kluwer Academic Publishers.

[7] Van den Herik is a computer science professor at Maastricht University, but also holds a part-time chair in AI & Law at Leiden University.

[8] On p. 263, H. Franken and H. J. van den Herik, Rechtsprekende computers?, in: A. Oskamp and A. R. Lodder (red.), *Informatietechnologie* voor *Juristen* (tweede druk), Kluwer: Deventer 2002: 251–271.

[9] Cf. J.C. Hage and B. Verheij, 'The law as a dynamic interconnected system of states of affairs', *International Journal of Human Computer Studies* 51: 1043–1077.

[10] Gray (2004, e-mail) explained: ''Ishikawa's paradigm is widely known in computer science. A jurisprudential fishbone is characterised by the pole fins that Ishikawa did not have. River simply indicates flow significance (unlike tree) and streamlining. A river system is a streamlined flowchart.''

[11] Review appeared in *Harvard Journal of Law & Technology*, Volume 12, Number 1 Fall 1998.

[12] Gray (2004, e-mail): "I regard my discovery of the spherical structure of a wholly formed adversarial system of rules as the most significant contribution made by my book (...). Prolog could not handle it; but something that could handle it had to be developed if the technology was to operate in the legal domain. Hence my further work – eGanges."

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