

THE THIRD INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE AND LAW: A Report and Comments by Dave Brown¹

From the 25th to the 28th of June 1991, I attended The Third International Conference on Artificial Intelligence and Law held at St Catherine's College, Oxford, England. The Conference is a biannual event which attracts people from various areas of expertise. There were a number of papers presented (nearly 40) and a range of interesting software was demonstrated.

More than 160 people attended the conference from Australia, the UK, Belgium, Argentina, Canada, the USA, Denmark, Germany, Israel, Italy, the Netherlands and other assorted places. Of interest to me (given an ethnocentric view of the world) the Australian contingent was probably the largest per capita representation at the conference.

ORGANISATION

Given the large number of papers presented, the coordination was nothing short of a miracle. The papers given were all bound into a single volume and distributed on the first day. It would have been desirable to have the papers distributed before the conference, but I understand that late submissions made this difficult.

PRESENTATION

Two tutorials were offered and I attended the tutorial entitled *Artificial Intelligence and Law: Opportunities and Challenges* given by Donald H Berman and Carole D Hafner from the Northeastern University, Boston, MA. This was a very interesting session which covered modelling legal decision making, direct representation of legal rules, rule-based expert systems, deriving "deep structure" rules from cases, conceptual retrieval and analogy and case-based reasoning. For a novice such as myself in this area² this was a good, if detailed, introduction to the process of AI but did not address the opportunities and challenges aspect as much as I would have liked.

Another tutorial was given (unfortunately at the same time as the first) entitled "Case-Based Reasoning" by Kevin D Ashley, University of Pittsburgh. I understand this was a great success and covered research in the field most thoroughly.

The conference was opened with a rather humorous address, including a joke about the size of lawyers brains, by The Lord Chancellor, The Right Honourable the Lord Mackay of Clashfern.

¹ Dave Brown B.A., LLB., Lecturer The University of Melbourne Law School.

² My interests lie more in the general application of information technology to the practice and teaching of law.

SESSIONS

Sessions started at about 9am and ran through to 6.30 pm with breaks for coffee and lunch over the three days. They tended to be long with most papers given only about 25 to 30 minutes. I must admit that giving so many papers in such a short space of time tended to be a bit heavy. I found that you had to be quite selective if you were not to be driven into the ground by the sheer weight of information.

The inaugural meeting of the International Society for AI and Law was held on the second day of the conference with all those in attendance being inaugural members.

A BRIEF LOOK AT SOME OF THE PAPERS

With so many papers given it is impossible to review the lot so I have selected a few that I found interesting.

Andrzej Kowalski's³ paper entitled *Case-Based Reasoning and the Deep Structure Approach to Knowledge Representation*⁴ maintained that building a legal expert system is not just an exercise in computer programming, but requires solid and articulated jurisprudential foundations. His use of a "Deep Structure" approach to knowledge representation to construct a case-based reasoning system, was interesting in that it involves a search for deep structures or fact patterns underlying legal doctrine which can account for and explain the decisions in cases where a more surface level analysis of the language of the law can not.

One of the key note speakers at the conference was Professor Neil MacCormick from the Faculty of Law, University of Edinburgh. Neil is an eminent legal academic and philosopher and I found his talk entitled *Legal Reasoning: Common Sense or Artificial Intelligence?* quite an eye opener. He was able to bring to bear a knowledge of both philosophy and law which, as I will explain later, was surprisingly lacking in many of the sessions.

George Vossos and others⁵ also tackled case-based reasoning combined with statutory interpretation in the domain of accident compensation law in a paper entitled "An example of Integrating Legal Case Based Reasoning with Object Oriented Rule-Based Systems: IKBALS 11". Their analysis of the problems of a strictly rule-based system was good particularly with reference to the open textured nature of

³ Lecturer at The University of Melbourne Law School, Australia.

⁴ "Case-Based Reasoning and the Deep Structure Approach to Knowledge Representation" in *Proceedings of the Third International Conference on AI and Law* ACM 1991 pg 21.

⁵ George Vossos, John Zeleznikow, Tharam Dillon and Vivian Vossos (from the Database Research Laboratory, Applied Computing Research Institute, La Trobe University, Melbourne, Australia) "An example of Integrating Legal Case Based Reasoning with Object Oriented Rule-Based Systems: IKBALS 11". in *Proceedings of the Third International Conference on AI and Law* ACM 1991 pg 31.

legal knowledge and reasoning. They sought to control these problems with the inclusion of a case-based reasoning module that 'lends a hand' to a rule-based reasoner when it strikes problems.

Another theme expressed in many papers was the need to cope with constant changes in law and the problems that these create for the builders of legal expert systems. Paul Bratley and others⁶ in a paper entitled "Coping with Change" drew attention to the problems faced by both minor and major change in the area and concluded that "...although most published work on legal expert systems pays lip service to the idea that they must be designed to cope with change, the problem is still entirely open".⁷ This was, I thought, an important observation of present research. Many attempts have been made to overcome this problem. I was interested in particular in the work of Trevor Bench-Capon and Frans Coenen⁸ in their use of isomorphism, however closer inspection of their approach raised more questions than were answered, as I will explain below.

Computer assisted instruction was given some time and raised much interest. A paper by Tom Routen⁹ and another by Kevin D. Ashley and Vincent Aleven¹⁰ were of great interest in this area.

THOUGHTS OF A NOVICE ON PROGRESS TO DATE OF AI AND LAW.

Firstly I find it very difficult to define the concept AI. When is it really just sophisticated database searching? At what point do we rule the line and say "this programme is thinking for itself", and is this at all possible? This issue didn't seem to be raised at the conference. Almost all the papers assumed that AI in general and AI in its application to law in particular, was both feasible and practicable and the only significant question was how to do it.

It seems to me that there may be some quite basic problems with the present research in the area of AI and law. There is little doubt in my

6 P. Bratley, J Frémont, E Mackay and D Poulin (from the Université de Montréal, Canada.) "Coping with Change" in *Proceedings of the Third International Conference on AI and Law ACM 1991* pg 69

7 Ibid

8 Trevor Bench-Capon and Frans Coenen "Exploring Isomorphism: Development of a KBS to Support British Coal Insurance Claims" in *Proceedings of the Third International Conference on AI and Law ACM 1991* pp 62-68

9 Tom Routen (from Dept. of Computing Science, Leicester Polytechnic, UK.) "Complex Input: A Practical Way of Increasing the Bandwidth for Feedback and Student Modelling in a Statute-Based Tutoring System" in *Proceedings of the Third International Conference on AI and Law ACM 1991* pp 77 to 85.

10 Kevin D. Ashley and Vincent Aleven (from the University of Pittsburgh School of Law USA) "Toward an Intelligent Tutoring System for Teaching Law Students to Argue with Cases" in *Proceedings of the Third International Conference on AI and Law ACM 1991* pp 42 to 52

mind that some of the premises that were accepted uncritically by many who gave papers in the area are at least questionable.

There is an assumption that statute law is somehow capable of reduction into a set of rules and that there is a "structure" that can be detected and emulated in the Knowledge Based Systems (KBS). This can then be applied to a given situation in isolation to other statutes, the common law and basic principles of justice.

It seems that this is an underlying assumption in the work of Trevor Bench-Capon and Frans Coenen from the University of Liverpool, UK.¹¹ For instance they say "...knowledge based systems in the legal domain will be more disciplined and better engineered if the structure of the knowledge base reflects the structure of the source documents from which the knowledge base is derived."¹² This is a statement of the obvious one would think, but it raises major issues.

Structure and the process of building KBS's

Firstly, the above statement assumes that there is a structure to statutes which can be identified and emulated or followed in the KBS so that it is isomorphic¹³ to the source. The source in this case includes The Mines and Quarries Act 1954, The H & SE Mines (Safety of Exit) Regulations 1988, The Claims' Inspectors Manual (1990) and a number of significant judgements.¹⁴ If there is a discernible structure, or at least one that relates to legal reasoning, this would be a fairly poor list of the sources used in that reasoning. Statutes may exist within structures of other statutes and they in turn lie within a legal structure comprising case law and basic legal principle and these in turn lie within a political and social structure. It seems that these factors are not taken into account as part of the source yet any lawyer would agree that these factors are as much a part of any interpretation process as are the sections of the statute or even the words that comprise those sections.

It is not clear which "significant judgements" are to be included in the KBS. Judgements that may seem to a lay person to have no relevance to a particular statute may actually have extensive ramifications.

Secondly, given that there is a useable structure in this context and that you could track down all the variables, to whom is this task given? On this point Trevor Bench-Capon and Frans Coenen say,

"We have found that adopting the principles of isomorphism results in a very disciplined and teachable methodology, and one which permits the construction of the knowledge-base to be spread over a multi-person team in an organised and sensible manner. This has been illustrated on the MAKE project in that two out of the three developers had not previously built a legal KBS and yet

11 Ibid

12 Ibid at p62

13 "being of the same or of like form" Macquarie Dictionary

14 Ibid at p64

the pilot was produced in six man¹⁵ months, including time taken to acquire knowledge of the tools.¹⁶

It is not clear that anyone with legal training was used on this project in what would be a monumental task by my reckoning even for the most learned legal scholar. They appear to believe that little if any legal expertise is necessary in the building of a KBS.

Once the "source" and its "structure" are determined they maintain that this can be dissected and turned into a "rule base"¹⁷. Is it possible to segment a term or section from its context and then maintain all the possible links to other factors within the deceptively simple "isomorphic" structure that Bench-Capon maintains can be built?

Although Bench-capon recognises the need for change in the KBS, the underlying assumptions come out in their approach to that change. They say,

"If in the case of a legal KBS, a Section of source, for example a Section in an act, is changed an isomorphic representation will allow the maintenance engineer to "trace" the change from the source through to the final rules representing this source. Any maintenance can then be implemented only on that rule set and, if the representation is truly isomorphic, no other rules will be effected other than if the changed Section of Source relates to other parts of the Source."¹⁸

They go on to say that in some cases it may not be possible to detach a piece of a knowledge-base (KB) from its context and consider its correctness in isolation;

"If we want to ensure that localised changes to the source material result in correspondingly localised changes to the KB, we must be sure that there are no ramifications of changes resulting from a subtle alteration of the meaning of the statement deriving from its context in the KB.¹⁹

They then refer to a forthcoming publication where they state these problems are discussed at greater length. It seems to me that this a real can or worms and I look forward to reading how they solve this incredibly complex problem of interrelationship between the contextually linked parts of the statute. In fact I have difficulty in thinking of any part of a statute that can operate in isolation.

Having grown up in an Australian State with a codified criminal law²⁰, my experience is that statutory interpretation is probably one of

15 I noted that little attempt if any was made by many of the speakers to use gender neutral terms at the conference.

16 Op. Cit., Trevor Bench-Capon and Frans Coenen at p66

17 Op. Cit., Trevor Bench-Capon and Frans Coenen at p66

18 Op. Cit., Trevor Bench-Capon and Frans Coenen at p67

19 Op. Cit., Trevor Bench-Capon and Frans Coenen at p67

20 Criminal Code Act 1924 Tas

the most difficult areas of legal enterprise in that there always seems to be a vast variety of factors that have to be born in mind even for the interpretation of a single word or group of words within one section of that code or statute²¹.

The meaning of a single word may vary depending on the context in which it is used and reference has to be made to case law, other sections of the statute, other statutes and basic principles of law and jurisprudence for any sensible result to be obtained. To the lay person this is often not apparent; try arguing with a clerk in a government department and ask him or her about concepts of natural justice and their application to the statutes that they administer. Added to these complexities are factors such as the political and social process (which are the contextual base of many decisions), public policy issues and now doctrines such as unconscionability that pervade nearly all areas of law and are really questions of basic morality which interrelate with so many other factors.

I am sure that I am not alone in my observations of the complexity of the situation. I thought it was a major point of Professor Neil MacCormick's talk²² that in his considered opinion the factors involved in statutory interpretation are so many and varied that he seriously doubted that it would ever be possible to computerise such a complex task.²³

Few if any of the papers at this conference questioned the basic assumptions of the field. It is my contention that this may be the result of specialisation in the field at too early a point in its development. A strong legal and philosophical input is needed in any major project in this area if its aims are to produce any worth while and useable applications.

As any new discipline grows it needs to maintain quite strong interdisciplinary links to its roots. In this case AI and law is inextricably linked to law, philosophy, and the sciences of perception as well as information science. As I understand it, the general field of AI still maintains these links. When one looks at the nature of the contributors to this conference and at the lack of diversity of contributions by them, it would seem that AI in application to law may be specialising too early.

The danger is that if we loose a diverse input into the field we will also lose the critical analysis of the foundation upon which it is built. It worries me that there was limited representation in the papers given, of a philosophical and critical analysis of the field.²⁴ This may have been because the organisers did not receive papers of this sort. Even if few were received, this is a sad indication of the area in general for it seems

21 See *R v Vallance* (1961) 108 C.L.R. 56 where the High Court of Australia looked at the word "intentional" among others and turned itself inside out with legal reasoning.

22 "Legal Reasoning: Common Sense of Artificial Intelligence?"

23 Professor Neil MacCormick is a joint author of a forthcoming collection of essays on statutory interpretation from the perspective of a number of jurisdictions.

24 Professor Neil MacCormick's paper *Legal Reasoning: Common Sense or Artificial Intelligence?* was not included in the folio of papers for some reason.

obvious that a greater interdisciplinary approach is needed than is indicated by this sample.

I can see an important use in this field in the development of new tools for decision making, legal education and research where for instance they can be used to help us identify issues in a given problem or to point out that a number of statutory provisions and cases may have a bearing on the analysis at hand. However there is a limit to how far we can go in producing a system that can aid decision making in law. Where this limit lies is debatable and needs greater debate at its foundation.

There are other areas in law where a form of AI may be more applicable such as sentencing where consistency over time is a major problem. Here the cross matching of case law could be used with great effect to give an indication of sentence consistency. However, this information would then need to be assimilated by a lawyer/judge to take into account public policy and fairness considerations. It may be that we will always need the expert at both ends of the system if we hope to use it effectively.

Some will say that they are not attempting to simulate legal reasoning, they are trying rather to replicate legal outcomes. How they can do the latter without the former is beyond me at this point.