Artificial Intelligence and Legal Theory at Law Schools

Thomas F. Gordon
Fraunhofer FOKUS
Kaiserin-Augusta-Allee 31
Berlin, Germany
thomas.gordon@fokus.fraunhofer.de

ABSTRACT

Currently, Artificial Intelligence and Law is an interdisciplinary field somewhere on the border between Computer Science and Law. For many reasons, this interdisciplinarity hampers its further development and the transfer of its results into both legal theory and legal practice. In this position statement, we argue that AI and Law should become part of legal theory, or rather a "school" of legal theory, to enable the field to eventually become an integral part of legal education and academic legal research. The paper discusses relationships between this revised conception of legal theory and other subjects of legal education, including jurisprudence, legal methods, legal informatics (law and computers) and legal research and writing, as well as consequences for the collaboration of academic lawyers and computer scientists in the field.

1. PROBLEMS WITH THE INTERDISCIPLINARITY OF AI AND LAW

The growth of the field of AI and Law requires sustained institutional support. It must be possible to obtain a Ph.D in AI and Law and have a reasonable opportunity to obtain a position as a professor at a university. Once in this position, it must be possible to offer courses and seminars in AI and Law, at least at the graduate level, to obtain research grants, to build up a team, and to offer a Ph.D. program, so as to nurture the next generation of scholars in the field. This next generation should have the same opportunities, to assure the sustainability of research in the field.

Moreover, if the field is to have any practical relevance, results from AI and Law research need to be systematically integrated into legal education and become part of the normal curriculum at law schools. Continuous interaction with and feedback from legal practice is necessary, if the field is not to devolve into an entirely "academic" exercise, in the pejorative sense.

At the moment, it is doubtful these conditions are met, except perhaps in The Netherlands. In the US, all AI and Law professors are now at computer science departments. A few have, or have had, a joint position at a law school. Most AI and Law PhDs have been in computer science. It has proven very difficult for these PhDs to continue their work in the field. If they do not also have a law degree, it is quite unlikely, if not impossible, for them to obtain a position at a law school. Surely any requirement for dual degrees, perhaps even multiple PhDs, would be a severe impediment to the continued growth of our field. A PhD in computer science may enable one to obtain a position at a computer science faculty, but this does not imply an opportunity to continue work in AI and Law.

In Germany the situation is even more desperate. The field of AI and Law is essentially dead here. It is part of the field of Legal Informatics (Rechtsinformatik). Interestingly, Legal Informatics is a legal discipline. All professors working in the area of Legal Informatics are at law schools. But AI and Law no longer plays a substantial role. Legal Informatics has become, for the most part, synonymous with Information Technology Law, i.e. it addresses substantive legal issues related to information technology, such as software patents, data privacy, data protection, or the law of electronic commerce. There are a small number of law professors who continue to consider legal informatics to be about legal applications of information technology, in particular Herberger and Rüßmann at the University of the Saarland. Their institute has worked on a range of topics, including uses of online databases and the World Wide Web for legal research, eLearning methods for legal education and the use of business process modeling tools to model cross-border legal transactions within the EU.

The proposal we want to present in this position paper for addressing these issues is to move towards integrating AI and Law into the field of legal theory. With time, AI and Law should become "just" a methodology for conducting research on legal theory. The goal should be to establish the field of AI and Law, if not the name, as a regular part of legal education and academic legal research.

In the next section, the current status of legal theory in legal education is assessed. We will find that legal theory appears itself to be in anything but a healthy state, and thus may be open for reform and renovation. After that, the proposal for integrating AI and Law into legal theory is presented

in somewhat more detail. This is followed by sections on the consequences of this proposal for legal education and further collaboration with computer science. We conclude with a discussion of some risks and challenges.

2. THE CURRENT STATUS OF LEGAL THEORY

Legal theory as a field of study is not well defined. Its relationship to legal philosophy and jurisprudence is not clear. In his recent book, "The Renaissance of Legal Theory from 1965 to 1985" [4], Hilgendorf remarked that some consider legal theory to be nothing more than innovative legal philosophy, especially when this innovation makes use of results from other disciplines. An indication of this is Hilgendorf's list of the most important topics in the German discourse on legal theory during the 20 year period which is the focus of his book:

- legal rhetoric
- legal hermeneutics
- legal argumentation theory
- discourse philosophy in law
- the theory of science in law
- law and the social sciences
- system theory and law
- Marxist philosophy and law
- political legal theory
- legal logic and deontic logic
- legal informatics

One can easily imagine Artificial Intelligence and Law being a part of this list. Hildendorf claims that once such topics fall out of fashion, significant results, if one is lucky, get integrated back into the mother field of legal philosophy.

It is not clear to me how many of these subjects were or still are of interest in American law schools. But a brief look at the curriculums of a few prominent law schools suggests that these topics currently play only a marginal role. Yale Law School offers courses on the philosophy of law, but the topics covered are limited to the nature of law and legal authority, the "philosophy" of particular substantive areas of law, such as torts or contracts, and the nature of rights, justice and political authority. In addition to a course on jurisprudence, Harvard Law School does offer three courses on topics which arguably belong to legal theory: rationality in legal decision making, rhetorical theory and law, and theories of legal interpretation and legal reasoning. The University of California at Berkeley (Boalt Hall) offers four "legal theory and ethics" courses: a workshop on law, philosophy and political theory, a course on representations of law in American literature as well as courses on the foundations of legal philosophy and basic legal values. When I attended King Hall Law School, at the University of California, Davis, back in the late 1970s, several legal theory courses were offered, including law and economics, legal philosophy, and a wonderful course taught by Jack Ayer on law and literature, using White's "The Legal Imagination" [8].

A position paper is not the place to conduct a systematic survey. It is not clear to me how representative these few examples are. But it is interesting to note that there is little overlap in the legal theory offerings of these law schools. Each offers a few courses, but there does not seem to be a generally accepted curriculum for legal theory at American law schools. Moreover, it can be presumed that all of these courses are electives, rather than a mandatory part of the core curriculum for all students. Even if most students take part in one or more of these courses, it seems fair to say law students in the US do not receive a systematic introduction to legal theory. Thus legal theory currently has almost no impact on legal practice.

Law students typically are required to take courses on "legal research and writing". Ideally such courses would be based on the state-of-the-art of legal theory, providing law students with everything they need to know about legal theory from a practical perspective. One who hasn't been to an American law school might think that these courses would be the place where law students learn to "think like lawyers", including basic legal reasoning and argumentation skills. Indeed, this is presumably the goal of such courses, but the preferred teaching method avoids any presentation or discussion of legal theory. Rather, the emphasize is on "learning by doing". Students are taught how to use a law library and are familiarized with the form, purpose and rhetorical style of various kinds of legal documents, such as memorandums, points and authorities and briefs. Presumably, these courses today also cover the use of computers for online legal research, using services such as WestLaw or Lexis. There is little evidence to suggest that legal theory has any impact on the subject matter of legal research and writing courses.

The situation is somewhat better in Germany, to my knowledge. There are a number of textbooks on "legal methods", including [2, 1, 5, 7]. Unlike legal research and writing courses in the US, these legal methods textbooks do teach students the theory of legal reasoning or, at least, legal justification. The most widely used textbook is the classic "Methodenlehre der Rechtswissenschaft" (Methods of Legal Science) [2], originally by Karl Larenz. In the original version, at least, the treatment of logic was limited to Aristotle's theory of syllogism. Recent editions have been revised and updated by his former student, Canaris. It would be interesting to see to what extend the treatment of formal logic has been updated or whether any results from AI and Law have been mentioned.

Another influential textbook is Koch and Rüßmann work on legal justification [5], first published in 1982. The book introduces many subjects from legal theory, as well as the necessary background from other fields, including:

- propositional and predicate logic
- methods and principals of statutory interpretation
- conflicts of legal principals

- limits of judicial discretion
- non-deductive forms of legal justification
- applications of methods from empirical science to fact-finding (Sachverhaltsfeststellung), including statistics and probability theory
- decision theory
- social choice theory
- various conceptions of justice (Hare, Habermas, Alexy, Rawls)

The field of Artificial Intelligence and Law was still very young at the time Koch and Rüßmann's textbook was published, so of course results from our field were not taken into consideration.

Interestingly, law schools in Germany are required by law to teach legal methods (Richtergesetz § 5a Abs. 2 Satz 3). Despite this legal obligation and the existence of suitable textbooks, separate courses on legal methods are not typically offered. Rather, most law schools in Germany elect to meet this obligation by teaching legal methods as an integral part of other courses, on substantive areas of law, usually however without the benefit of one these texbooks.

There is a need for a new textbook on legal theory and methods which is well informed by results from AI and Law. Giovanni Sartor has just completed a book on legal reasoning, which does take current results from the field artificial intelligence and law into account, along with results from psychology, cognitive science, game theory and decision theory [6]. However, at almost 700 pages, Sartor's book is surely not suitable as a legal methods textbook for first-year law students. Such a book remains to be written. Sartor's book is more suitable for an elective course on legal theory or as a reference text for academic research at the graduate level.

3. INTEGRATING AI AND LAW INTO LEGAL THEORY

We have argued that the future of AI and Law as a field is uncertain, due to its interdisciplinarity and subsequent lack of sustained institutional support in either law school or computer science departments at universities. And we have tried to assess the role of legal theory in legal education. Our preliminary analysis, based admittedly on a rather unsystematic survey of the course offerings of a few law schools, suggests that legal theory courses are offered only sporadically and are not part of the core curriculum. The depressing conclusion is that legal theory has little or no impact on either legal education or legal practice. Is there any other profession whose practitioner's recieve so little formal education about the theoretical foundations of their work?

The sorry state of legal theory and the precarious situation of AI and Law may present an opportunity for both. The central tenet of my position statement is that AI and Law should take steps to establish itself as an integral part of legal theory. I do not want to make strong claims here about the precise form this integration should take. There may be several possibilities. At one extreme, the methodology and results of AI and Law could be exported into legal theory in such a way that AI and Law as a separate field ceases to exist. Or AI and Law could retain its identity by becoming a particular school of thought within legal theory, comparable to the various schools of psychology, such as cognitive psychology, humanistic psychology, or cognitive psychology.

Figure 1 illustrates the main features of this proposal. The stick figures in the diagram represent different research fields. The arrows between the stick figures show how the fields are related. An arrow from one field to another means that the first field is a subfield of the second. For example, legal theory is considered a subfield of jurisprudence. The ovals in the diagram represent various research topics. The arrows between the topics show how results from research on one topic are used in other topics. For example, research on legal reasoning uses computer model of intelligence.

Notice that we distinguish between fields in the sense of communities or networks of researchers and the topics addressed by these fields. In principal, several fields could address the same topic, each from its own perspective, and each field can address several topics. So there would be nothing inherently wrong with computer science and law both having an interest in the topic of legal reasoning. We could count ourselves very lucky if both fields turn out to have a sustained interest in AI and Law. Obviously, I doubt this will happen. As a field, we need to develop a survival strategy or plan.

A few caveats are in order. The diagram is anything but complete. We've shown only enough to illustrate the points we want to make. For example, not all subfields of computer science or law are displayed. And one could argue about the choice of names for some of these fields. For example, perhaps "legal philosophy" would be a better name than "jurisprudence" for the field which addresses the topic of legal foundations, reserving jurisprudence for academic research on particular substantive areas of law, such as torts. And Americans might prefer the traditional "legal research and writing" to the more European "legal methods". I preferred the latter because it seems more general. Finally, "legal information technology" is an attempt to translate the German "juristische Informatiksysteme" into English. A more literal translation would be "legal informatics systems".

The next thing to notice is that AI and Law is not explicitly mentioned. This is of course intentional, since the proposal is to make AI and Law an integral part of legal theory, which is displayed. Alternatively, AI and Law could have been displayed as a subfield of legal theory. But, as discussed above, I would rather leave the issue about the exact relationship between AI and Law and legal theory open.

4. CONSEQUENCES FOR LEGAL EDUCATION

None of the legal fields or topics shown in Figure 1 are new. Indeed, one of the goals of this proposal is to avoid fashionable terms which may not stand the test of time. This is one reason for my preference for subsuming "AI and Law" under the more timeless term legal theory. Another reason is to emphasize the ambition to become a subfield of law, rather

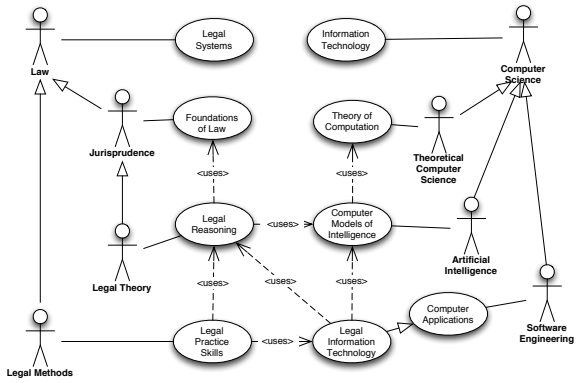

Figure 1: Division of Responsibility

than continue as an interdisciplinary subject straddling the fence between two fields.

To help support my thesis that AI and Law should become, or be considered to be, a subfield of law, consider Figure 2. This is slightly revised version of a diagram from [3], in which I tried to identify the main kinds of legal reasoning tasks. Notice, incidentally, that justifying legal decision is just one of many legal reasoning tasks in this model. These tasks, I claim, cover most if not all of the subject matter of AI and Law research. Notice that each topic studied by AI and Law, according to this view, is entirely within the field of law and thus would be a natural and legitimate topic for legal theory.

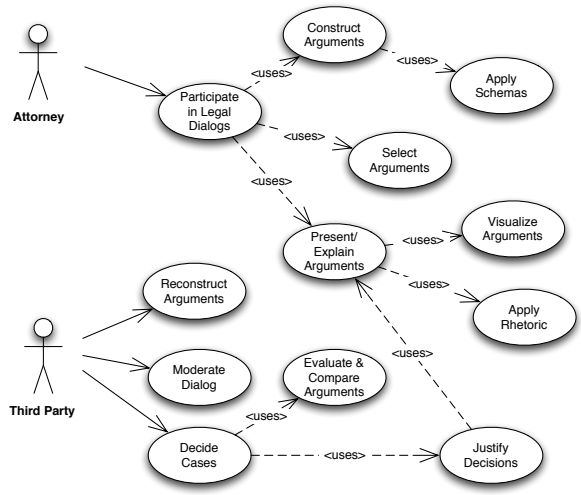

Figure 2: Legal Argument Use Cases

The goal of this revised field of legal theory are those of AI and Law, to develop a clearer understanding of legal reasoning and argumentation using computer models. This is a theoretical enterprise in the field of law. Its goal is not the design or implementation of legal reasoning support systems or other kinds of legal information technology. These topics would remain in the realm of software engineering, as a subfield of computer science. Rather, the goal of legal theory is to develop an understanding of legal reasoning which is clear enough to be sufficient as a foundation for both legal practice skills and legal information technology. This is illustrated by the use relations in Figure 1.

Hilgendorf claims that legal informatics (Rechtsinformatik) is "applied legal theory" [4]. He makes it clear that he means by this that not only does legal informatics apply results from legal theory but also that, in his opinion, legal informatics is a subfield of legal theory. I do not share this view. As mentioned earlier, legal informatics has become mostly information technology law. The part of legal informatics which was concerned with the design and implementation of support systems for legal tasks is quickly disappearing from the field of legal theory and returning to the field of computer science. This is as it should be, in my opinion. Thus legal information technology is shown as a subtopic of computer applications and the responsibility of software engineering in the diagram. To avoid confusion, it would be better if legal informatics would be renamed to information technology law or something similar.

Where I agree with Hilgendorf is that legal theory *should* provide the legal foundation for legal information technology. Legal reasoning support systems and other kinds of legal information technology should apply legal theory, just as simulation software for physicists should apply models from theoretical physics. The problem however is that legal theory is currently too diffuse and poorly developed to provide this foundation.

Most models of legal reasoning which have precision sufficient to serve as a foundation for legal information technology have been developed by colleagues working in computer science departments or research institutes, not law faculties, even though many of these colleagues are lawyers by education or have dual degrees. Notable exceptions include Giovanni Sartor, at the law school of the University of Bologna, Tom van Engers, Radboud Winkels and others at the Leibniz Center for Law, which is part of the law faculty of the University of Amsterdam, and Haijme Yoshino, a member of the law faculty at the Meiji Gakuin University in Tokyo. (I am sure there are several others and I apologize to those who I have not mentioned here by name.)

These law departments are living examples of the kind of institutional support AI and Law requires if it is to be sustainable in the long run. It would be useful to conduct an investigation of these and other such law departments, to determine to what extent AI and Law, by whatever name name, has become an established and recognized field in the department and, if so, to learn how this has been accomplished.

As mentioned above, not only should legal theory provide a foundation for legal information technology, but also for courses on legal methods or practice skills. Missing from Figure 1 is some indication of feedback from legal practice to research on legal theory. But this kind of feedback from practitioners is vital for legal theory to have any hope of becoming practically relevant. Arguably, it is this lack of practice relevance which has prevented legal theory from becoming a core part of the curriculum at law schools. Here

too legal theory can learn from computer science, in particular from software engineering. Legal theory research should be driven by *user requirements* and a careful use-case or task analysis. Particular theories need to be validated experimentally. Essentially, legal theory needs to become more like science and engineering and less like traditional philosophy, with its emphasis on the critical appraisal of the prior literature by famous theorists, such as Hans Kelson.

Again, there is a great need for a new textbook on legal methods for first year law students which is informed by results from AI and Law. Since the field is progressing rapidly, this should be conceived as a kind of living document, to be revised and updated on a regular basis. This textbook should not require a computer science background to understand. It should, I believe, be a plain English collection of recipes, or best practices, for performing each kind of task important for legal practice. Complex procedures can be explained with the help of software engineering diagrams rather than formal logic or mathematics. Techniques from "informal logic" for diagramming arguments can be used to teach argumentation and critical thinking skills. This approach is already being used successfully, I believe, in communications departments.

5. CONSEQUENCES FOR COLLABORATION WITH COMPUTER SCIENCE

AI and Law is not a computer science subject, but rather "only" makes use of theoretical and practical results from computer science. A field does not become interdisciplinary only because it uses results from another field. Law has always used knowledge about natural languages, from fields such as English or Rhetoric. But we do not routinely refer to the whole field as English and Law, or Rhetoric and Law, even if occasionally courses on such subjects are offered at law schools.

From the perspective of computer science, law is best viewed as one of many application domains. Computer scientists and software engineers may choose to focus their energies on a particular application domain, such as law, if for no other reason than it is a time consuming and difficult task to learn enough about the application domain to be able to communicate effectively with users and clients, for example to understand requirements. To some extent, computer scientists doing applied work need to acquire knowledge of the application domain. People who work on applications in a particular domain long enough may even become experts in this domain. Some may even acquire an additional degree or some other formal qualification.

I want to be careful not to offend any of colleagues at computer science departments or research institutes with my suggestion that AI and Law should become a part of legal theory, firmly embedded in law faculties. First of all, as a researcher at the computer science research institute, I am one of you. My motivation in making this proposal is to initiate a critical discussion about what steps are necessary to assure the continued viability of AI and Law research. It is my conviction, also from personal experience, that we cannot rely on continuous support from computer science departments or institutes in the long term. The legal domain, indeed every application domain, is only interesting to computer science departments or institutes so long as it serves the interests of their primary research topics, whatever these may be. And due to the necessity of finding funding for research, these organizations need to be quite flexible about their choice of application domains, going wherever the money at the moment happens to be.

This proposal does not require anyone to change their research focus. Computer scientists who have managed to find an environment supportive of their research on legal theory should remain welcome, with open arms. But a natural and sensible division of labor between law and computer science, I claim, would be to have law departments take responsibility for legal theory and computer science departments for applying results from this research on legal theory to design and develop legal information technology. Close collaboration between academic lawyers and computer scientists remains important, indeed essential. Development of systems rarely follows the water-fall model. Problems arising during the design or implementation of legal informatics systems may reveal inadequacies with the current state of legal theory. Legal theorists need to be made aware of these problems. As mentioned above with regard to practicing lawyers, there needs to be a feedback loop from practice to theory here as well.

There is parity between law and computer science in this proposed division of labor. Legal theorists make use of modeling methods and other results from computer science, and provide feedback to computer scientists when things go wrong. Conversely, software engineers responsible for developing legal applications of information technology should take care to apply the latest results from legal theory and report back to legal theorists when these results fail to provide adequate guidance.

6. RISKS AND CHALLENGES

This proposal requires a certain level of technical sophistication on the part of academic lawyers doing research on legal theory. Presumably, the main reason so much fundamental research on AI and Law has been conducted by computer scientists rather than lawyers is simply because few lawyers in the past have had sufficient expertise in computer science methods to build computational models of legal reasoning. So the first hurdle to be overcome on the way to establishing AI and Law as a part of legal theory in law schools is to find a way to enable lawyers to acquire a sufficient background in computer science. Surely we cannot expect law schools to teach computer science in addition to law.

In the US, at least, we need to remember that law schools are professional schools at the graduate level. Almost any subject may be studied at the undergraduate level before beginning law school. In principal, persons with undergraduate degrees in computer science can go on to study law. I have no idea how often this happens in practice. Most people in AI and Law have taken the opposite route, from law to computer science. Here there is a bit of the chicken and egg problem. If AI and Law were an established field at law schools, more computer scientists might be inclined to go on to study law.

University education is organized quite differently in Ger-

many, but there is a trend in all of Europe to uniformly offer bachelor, masters and PhD degree programs, in order to make degrees comparable and facilitate mobility. If this trend continues, it may well become possible for persons with a bachelors degree in computer science to obtain a masters in law, or some degree comparable to an American J.D.

Another challenge is establishing legal theory of any kind as a basic part of legal education at all law schools. Legal theorists on law faculties, I'm afraid, do not enjoy the same prestige as colleagues focusing on substantive legal topics, such as torts or contracts. Presumably it will be necessary for the foreseeable future for law professors interested in legal theory to also take responsibility for substantive legal domains. Again, legal theory will grow in prestige only if it succeeds in proving its practical relevance. And for this, I am convinced, a requirements-driven engineering methodology from computer science can only be beneficial.

Finally, should this proposal become accepted in the AI and Law community, some way must be found to manage the transition from the current interdisciplinary organization and identity of the field to the goal state as a part of legal theory. AI and Law is a small but vital community. We must find a way to grow and sustain the field without alienating existing members from the field of computer science. There are two important roles for computer scientists in the proposed model, one more theoretical and the other more practical. The theoretical task is the development of computational models of reasoning and argumentation, not restricted to legal reasoning, as a part of Artificial Intelligence. The practical task is the development of legal applications of information technology. It may well be that most computer scientists in the field of AI and Law already see themselves as having one of these roles. These computer scientists should not feel threatened by the suggestion that lawyers should take primary responsibility for advancing the state of legal theory, even when methods from computer science are used for this purpose.

Acknowledgements

I would like to thank Herbert Fiedler, Lothar Philipps and Helmut Rüßmann for their help with information about the teaching of legal methods in German law schools.

7. REFERENCES

[1] F. Bydlinski. *Juristische Methodenlehre und Rechtsbegriff*. Springer-Verlag, zweite edition, 1991.

[2] C.-W. Canaris and K. Larenz. *Methodenlehre der Rechtswissenschaft*. Springer Verlag, fourth edition, 2005.

[3] T. F. Gordon. A use case analysis of legal knowledge-based systems. In D. Bourcier, editor, *Legal Knowledge and Information Systems (JURIX 2003)*, Frontiers in Artificial Intelligence and Applications, pages 81–90, Utrecht, 2003. IOS Press, Amsterdam.

[4] E. Hilgendorf. *Die Renaissance der Rechtstheorie zwischen 1965 und 1985*. Ergon Verlag, 2005.

[5] H.-J. Koch and H. Rüßmann. *Juristische Begründungslehre – Eine Einführung in Grundprobleme der Rechtswissenschaft*. C.H. Beck Verlag, München, 1982.

[6] G. Sartor. *Legal Reasoning: A Cognitive Approach to the Law*. 2005.

[7] J. Vogel. *Juristische Methodik*. Gruyter Verlag, 1998.

[8] J. B. White. *The Legal Imagination*. Little, Brown and Company, 1973.