

Legal argumentation with cases

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One of the objectives of the AI and Law community is to build legal expert systems. In this position paper I am going to take a stand on two main points - lack of legal expert systems that can be accessed by lay-users; focus on the application of state of the art AI techniques to overcome the hurdles in developing legal expert systems that can be accessed by lay-users e.g. natural language processing, common-sense reasoning.

The potential users for legal expert systems could be broadly classified in terms of depth of legal knowledge possessed by the user and their frequency of using the system: 1) people with legal knowledge who might want to use legal expert systems regularly to construct and evaluate their legal arguments e.g. lawyers, judges. 2) people who want to acquire legal knowledge and therefore use it regularly for a short period of time in their life e.g. students, people who work with legislative rules 3) people who work with legislative rules and therefore use legal expert systems in their day-to-day work life e.g. a person working with tax law system and 4) people who are probably going to use the system only a few times in their life to know about their legal situation in some dispute - lay-users. The existing legal expert systems are mostly applicable only to the first three groups of users.

Domains which have a well structured statute (e.g. British Nationality Act or Home office deduction from Federal Income tax law), reasoning starts at the statutory level; when there is a problem with the application or interpretation of a statutory norm to a fact, there is a transition from statutory reasoning to reasoning with precedents or purpose of law. The formalisation of statute and the problems associated with a legal expert system carrying out statutory reasoning are not new for the AI and Law community (e.g. [9] [4]). In domains where there are no well defined rules, the main means for assessing the legal situation is through factors. Factors are a collection of facts that have some legal significance in a given case. In these domains arguments are constructed and evaluated by comparing and distinguishing the current case and its precedents in terms of factors (e.g. Trade secrets).

One of the major reasons for the limitations in the development of legal expert systems for lay-users is that legal expert systems for lay-users has always been under debate. Providing legal advice is a crucial task and involves factors such as interpretation of human actions, emotions, etc. These reasons will always be raised to question the practicality of legal expert systems for lay-users. But with a thorough research on the domain, potential users and identification of the barriers, a legal expert system designed for those users with the application of appropriate AI techniques to overcome the barriers, could be an essential one for that domain. The reason for the limited ground work on the development of legal expert systems that can be accessed by lay-users is that the research on representation of precedents and their interaction with statute and purpose of law have been restricted to a format that, can for the most part be worked on/with only by people who work regularly with legal materials. The representation of cases as factors and dimensions in a legal expert system were introduced in HYPO [1]. A factor is applied to a case depending on whether a certain pattern of facts are present in the case or not. Dimensions were used to indicate the extent to which a factor is present in the case. CATO[15] introduced a factor hierarchy using which two other argument moves can be made in addition to the argument moves in HYPO. Reasoning based on factors have been dominating in AI and Law since HYPO. Reasoning with cases has been described as a process of constructing, evaluating and applying a theory in [13]; theories explaining the decision in precedents can be created using the theory constructors; competing theories can be evaluated and the best theory can be applied to solve a new case. [14] gives an account of the CATE, AGATHA and ETHEL which aides in theory construction. The theory construction model is a powerful model but the application of such a system is more beneficial to people familiar with legal reasoning. In [2] a body of case-law were represented using Dung's abstract argumentation framework of [10]; the same body of case-law were then represented using value-based argumentation framework of [3] in [14] and extended argumentation framework of [11] in [12]. Representation of the case-law as an argumentation

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framework enables the reconstruction of the reasoning that was carried out in precedents and also solve new cases using the constructed argumentation framework. Although each argument in these frameworks were abstract, most of them seem to take the form of factors and dimensions. In [14], BDI agents were used to generate the value-based argumentation frameworks and it was shown that the knowledge required by the agents to generate those argumentation frameworks can be provided by the theory construction tools. Legal expert systems built based on these models can be very useful for legal practitioners and people who wish to understand a particular legal domain. [7] provides an account of a model of how courts are constrained to respect precedents. The paper views precedential constraints as defeasible rules. This model again works with a set of factors and also mentions the lack of well understood work on assignment of factors to facts. In [6] illustrated the formalisation of CATO style arguments in ASPIC⁺ framework. Again this paper indicates the lack of well accepted model for the assignment of factors to facts.

From my experience working on the EQUALS project, legal expert systems designated to deliver preliminary legal advice can be of great benefit in some domains such as the application of the *Equality Act 2010*. The aim of EQUALS project was to study the potential of legal decision aids in delivering employment related legal advice to mental health patients. To achieve this we formalised relevant sections from the Equality Act 2010, UK and developed a rule-based legal decision aid. The Equality Act 2010 concerns people with various protected characteristics such as age, race, disability, etc; it aims to prevent discrimination and promote equality. Our focus was specifically on “mental health problems” and “employment”². We worked as a team with mental health experts³ and an employment lawyer⁴. We formalised the relevant sections from the Equality Act 2010 to advise people on: whether their illness is covered by the Act (to be protected by the Act because of disability, the person’s health condition should satisfy the conditions set out by the Act); whether they are being discriminated against at work because of their disability and what the legal consequences are; whether they are entitled to adjustments in the workplace; whether those adjustments are reasonable; what are the legal consequences if their employer fails to provide reasonable adjustments. The accuracy of the system was tested by comparing the conclusions made by the system for a set of cases against an employment lawyer’s conclusions for those cases. We assessed and studied the usability and the desirability of the rule-based decision-aid based on feedback from potential users (mental health patients who had no knowledge about the Equality Act 2010) and professionals (vocational health advisers and occupational physicians who had some knowledge about the Equality Act 2010). The results of the user testing were not completely satisfactory owing to the dense language used in the legislation, reflected by the rules in the rule-based system. But the user feedback did not fail to indicate high desirability for such systems. The feedback from the potential professional users was very positive - again indicating that such systems are of more benefit to users with some knowledge about the legal domain. The professional users confirmed the desirability of such systems for lay-users by citing some factors. For instance the matters involved in these cases are very delicate and personal - they involve a person’s mental health problem which are often not perceived as a health problem by the person; it involves details about their relationship with their employer and their colleagues. As a result some people may hesitate to discuss these matters with their vocational health advisers. So such users may prefer to use a software to get their advice which would assure them that their information is kept confidential.

As discussed earlier, the current state of the art in legal reasoning with cases mostly involves reasoning with precedents in terms of factors. Thus making the current AI and Law applications applicable mainly to legal practitioners or law students. This brings us to the widely discussed issue in case-based reasoning - “How to carry out facts-to-factor transformation”? Cases are represented in the form of factors. We need to focus on tools to bring about the facts-to-factors transformation. The EQUALS project was limited to testing a rule-based system; The next stage is my PhD in which I am working on a hybrid system that can support statutory interpretation. One such system was CABARET which achieved statutory and case-based reasoning [4]. While CABARET works on the basis of some control heuristics, I am working on a model that works on the basis of a classification of statutory interpretation problems; and when the type of interpretation

²The EQUALS project is now being maintained and expanded to include other protected characteristics by Monad Solutions (UK). The EQUALS project is funded by Guy’s & St Thomas’ Charity.

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problem has been identified, case-based reasoning or teleological reasoning is applied, as appropriate. The basis for this classification is Prakken’s description of three forms of open-texture - “Vagueness”, “variable-standard” and “defeasibility” [5]. This has paved the way for the design of a rule-based system that can use a back-end support reasoner to perform statutory interpretation and therefore making a rule-based system accessible to lay-users. In [8] Ashley et al tried out assigning factors to case texts automatically using classifiers. In order to build a legal expert system for lay-users we need to go a step backward and start from collecting the fact situation. In my PhD thesis I am mainly focusing on ways to collect information from the user, transforming it into a coherent fact situation, and reasoning about the application of vague statutory predicates to that fact situation. As part of this I am also focusing on the representation of precedents and purpose of law in a form that can support reasoning with facts rather than factors. The proposed design and the addressing of these issues could be a positive step towards developing legal expert systems for lay-users.

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