

The Role of Open Texture and Stare Decisis in Data Mining Discretion

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Abstract

The use of knowledge discovery from database (KDD) techniques such as neural networks in the legal domain can alter the practice of law by introducing a non-expert mechanism for predicting and analyzing Court outcomes. Legal domains that are well suited to KDD are those in which a high level of judicial discretion exists particularly where the source of the discretion stems from a principle statute that presents a list of factors to be taken into account without specifying the relative importance of each factor.

This kind of discretion, sometimes referred to as *shopping list discretion* contributes to the characterization of law as open textured in a way that is different to situations more often considered open textured by the artificial intelligence and law community. Whereas forms of automated reasoning such as non-monotonic logics appropriately model other forms of open texture, KDD techniques are particularly well suited to modeling open texture characterized by shopping list discretion. This is understandable if a distinction between traditional, local and personal stare decisis is drawn. KDD is suitable for discretionary tasks because local and personal stare decisis often dominates traditional stare decisis in these tasks.

This has two immediate ramifications for KDD that are discussed in this paper. The first involves a conceptualization of judicial error in local/personal stare decisis on empirical grounds. The second involves the inclusion in KDD training sets of cases that are not *interesting* in that they set no precedent and/or are not appealed. These points are illustrated by articulating assumptions made in applying KDD to the prediction of property outcomes in Australian family law. This is a domain that involves considerable judicial shopping list discretion in addition to an emphasis on local and personal stare decisis.

1 Introduction

The knowledge discovery from database (KDD) process involves the collection, pre-processing and transformation of data so that a data mining algorithm such as neural networks, rule induction or mathematical programming can be applied to discover useful patterns or knowledge from the data. In Zeleznikow and Stranieri (1997) we report results from the application of KDD techniques to predict property decisions in the Family Court of Aus-

tralia. This is generally regarded to be a discretionary domain because the principle statute lists factors that must be taken into account but encourages a trial judge to exercise discretion in weighting the factors.

Tasks such as property prediction in family law that involve a decision maker in weighing known factors in a manner that is largely his/her own choosing, are well suited to the KDD process, because discretion apparent in this process can be learnt by data mining algorithms. This kind of discretion contributes to the characterization of law as open textured, yet is a different form of open texture than that considered by most applications of artificial intelligence to legal reasoning. Consequently, other forms of automated reasoning such as first order predicate logic, the non-monotonic logics (NML) or case based reasoning (CBR) perform well with other forms of open texture such as defeasible rules or ambiguous terms, but are not immediately applicable to discretion. Conversely, data mining algorithms that have not demonstrated clear applicability with other forms of open texture are very well suited to modeling discretion.

In the next section we discuss the relationship between discretion and open texture, in order to claim that the judicial discretion that arises from a statute that presents a judge with a list of factors represents a type of situation that characterizes law as open textured. Furthermore, this form of open texture is fundamentally different to other forms of open texture and consequently, requires automated reasoning techniques that are different to ones used with other forms of open texture. The feature that makes discretionary domains different to other open textured domains involves the concept of *stare decisis*.

Notable commentators on Australian family law including Kovacs (1992) and Ingleby (1993) assert that the appeal courts in Australia have failed to fetter the discretion trial judges have. Kovacs (1992) categorically claims that *stare decisis* has broken down. However, despite this, practitioners are able to make accurate predictions about Court outcomes; a feat that would seem to require a rigid adherence to *stare decisis*. This apparent paradox is resolved if we adopt the view described by Wassestrom (1961) and Lawler (1964) that there are three forms of *stare decisis*, traditional (decisions follow principles laid down by higher courts), local (decisions are consistent with judges of the same court) and personal (a judge is consistent with his/her past decisions).

The *stare decisis* that Australian family law analysts claim is lacking, is traditional *stare decisis*. Predictions in family law are made by practitioners with some accuracy because of the prevalence of local and personal *stare decisis*. This view on *stare decisis* has three ramifications for the application of KDD techniques. The first ramification relates to the conceptualization of judicial errors required in order to apply KDD techniques. The second ramification relates to the types of cases suitable for application with data mining algorithms. The third ramification, which is beyond the scope of this paper, relates to the nature of explanations judges offer for outcomes.

Tasks that require trial judges to weigh a list of factors are suited to KDD because these tasks emphasize local and personal *stare decisis* rather than traditional *stare decisis*. Tasks more suited to the other forms of automated reasoning deal with other kinds of open texture such as defeasible rules or ambiguous terms deal with precedent cases or legal principles because these concepts are more closely associated with traditional *stare decisis*.

In the next section of this paper, we describe our claim that the discretion that manifests in weighing up a list of factors is a distinct type of open tex-

ture. In the section following that, we describe the distinction between types of stare decisis. Following that, we describe the first ramification this conceptualization of discretion and stare decisis has for KDD: judicial error. In section 5, we outline the second ramification, the removal of leading cases from KDD training sets.

2 Discretion is a different form of open texture

Legal reasoning is characteristically indeterminate. Bench-Capon and Sergot (1988) view the indeterminacy in law as a specific consequence of the prevalence of open textured terms. They define an open textured term as one whose extension or use cannot be determined in advance of its application. An analysis of the concept of open texture by Prakken (1993) identifies distinct types of situations that are difficult to resolve because of the open textured nature of law:

- **Classification difficulties.** Hart (1958) presents a local government ordinance that prohibits vehicles from entering a municipal park. He argues that there can be expected to be little disagreement that the statute applies to automobiles, though there are a number of situations for which the application of the statute is debatable. This is open texture that manifests as classification ambiguities.
- **Defeasible rules.** Another type of open texture arises from the defeasibility of legal concepts and rules. Any concept or rule, no matter how well defined, is always open to rebuke. Rarely do premises or consequents exist in law that are universally accepted. Rules may be defeated in various ways, such as by *lex superior* or in the context of exceptional circumstances. Different non-monotonic logics have been developed or applied to these situations in a number of studies including those of Hage (1997), Prakken (1993) and Gordon (1995).
- **Vague terms.** Legal tasks are often open textured because some terms or the connection between terms are vague. A judge finds that the various interpretations of terms such as *reasonable* or *sufficient* stems from the vagueness of these terms and not from classification dilemmas or defeasibility requirements. Brkic (1985) labels this a gradation of totality of terms which he claims is one reason that deduction is an inappropriate inferencing procedure for many problems in law.

The existence of judicial discretion contributes to the open textured nature of law. Yet some situations that involve discretion cannot be described as instances of classification difficulties, defeasible rules or the presence of vague terms. We thus argue that situations that involve judicial discretion are a distinct form of open texture. However, in doing this, we are defining discretion as the freedom a decision maker has to weigh relevant factors. A brief survey of the concept of discretion in the jurisprudential literature indicates this is one view of discretion.

Bayles (1990) surveys jurisprudential viewpoints on discretion and illustrates that the concept of discretion varies considerably amongst theorists.

Hart (1994)¹ labels the law making role that judges exercise in relatively rare, difficult cases, as discretion. This is a view of discretion that does not explain the freedom an Australian Family Court judge has to weight factors in cases that are, in Hart's terms, core and not penumbra.

Dworkin (1977) has presented a typology of discretion available to a judicial decision maker. Weak discretion describes situations where a decision maker must interpret standards in his own way. A sergeant exercises this type of discretion in selecting the five most *experienced* patrolmen.² In this case, the standard of *experience* can be interpreted in a number of ways. Strong discretion characterizes those decisions where the decision maker is not bound by any standards and is required to create his or her own standards. A sergeant asked to choose five men exercises strong discretion if no guidelines are specified as to how the men are to be selected.

Christie (1986) describes different situations that involve discretion in order to claim that its exercise inevitably involves power relationships within a political system. His approach is particularly useful for us, not because of the socio-political conclusions he draws but because he specifically identifies statutes that provide a decision maker a list of relevant factors, cynically referred to as *shopping list statutes*, as fields of law that necessitate a Dworkian weak discretion. He points out that an enormous range of legal decisions could be plausibly justified under the *shopping list* type of statute, US hazardous wastes Section 520 of Second Restatement of Torts (1977). In highly discretionary, *shopping list statutes*, a larger proportion of all possible outcomes are considered acceptable than is the case in less discretionary domains.

The indeterminacy that arises from *shopping list* discretion is a type of open texture that does not involve classification difficulties, defeasible rules or vague terms. A hypothetical panel of Family Court judges who agree on all facts of a particular divorce can conceivably arrive at different percentages of the assets that ought to be awarded to the wife (and husband). Different outcomes may be due to the presence of vague terms which are interpreted differently by different judges. In part, the different outcomes may be due to classification type anomalies. One judge classifies a lottery win as a contribution to the marriage whereas another does not. Different outcomes may even be the result of defeasible rules. One judge applies the principle of an *asset by asset* approach whereas another considers that principle irrelevant and adopts the *global* approach.³ However, in discretionary domains it is possible that outcomes may still differ even if there are no classification anomalies and the same principles have been used by all judges.

Outcomes may still be different because judges apply different weights to each relevant factor. Neither judge is wrong at law because the statute (Family Law Act 1975) clearly affords the decision maker precisely this sort of discretion. Thus, an additional situation is apparent; one where the deci-

1 Hart discusses the lack of emphasis on the concept of discretion in this theory at page 252 of the 1994 text. This text is the second edition of his influential 1961 text.

2 Another type of 'weak' discretion describes those decisions which are discretionary in that they are final and no opportunity exists for the decision to be challenged or appealed. A football umpire has discretion in this sense of the word because a player must accept the decision as final. This type of situation is not central to the discussion here and will not be pursued.

3 Judges using the asset by asset approach in devising an equitable property order on divorce litigants carve up the property asset by asset whereas those using the global approach lump all assets together and award a percentage of the total to both parties. The High Court case of *Norbis v Norbis* (1986) FLC 91-712 validated either approach

sion maker is free to assign weights to relevant factors. This discretion will certainly contribute to the open textured nature of law and contribute to indeterminacy.

The view that *shopping list* type statutes present a decision maker with the opportunity to exercise a Dworkian weak discretion and arrive at any one of a set of acceptable outcomes has three important ramifications for the use of data mining algorithms in discretionary domains. The first ramification involves judicial error. The presence of discretion indicates that two or more legitimate judgements may have identical findings of fact yet different outcomes. Traditional stare decisis cannot be obviously seen to be working as rigorously in these domains as in *non-shopping list* domains. Despite this, practitioners are able to predict judicial outcomes with some accuracy because local and personal stare decisis is prevalent. In the next sections of this paper, we draw on jurisprudential analyses of the concept of stare decisis in order to explain the consistency of decision making and to justify the use of KDD in the domains characterized by strong local and personal stare decisis. Following that we outline the second ramification for the use of data mining: the selection of cases to expose to the KDD process.

3 Stare decisis

Kovacs (1992) notes that the principal statute underpinning family law, the Family Law Act (1975) presents a '*shopping list*' of factors to be taken into account in arriving at an order that distributes matrimonial property to divorcees. The relative importance of each factor remains unspecified and many crucial terms are not defined. For example, the age, state of health and financial resources of the litigants are explicitly mentioned in the statute as relevant factors yet their relative weightings are unspecified. The Act clearly allows the decision maker a great deal of discretion in interpreting and weighing factors.

According to Kovacs (1992) and also Ingleby (1993), family law in Australia differs from other legal domains in that the principle of stare decisis, that like cases should be treated alike, is not rigorously applied in family law. Kovacs (1992) contends that the High Court in an early leading case, *Mallet vs Mallet* (1984) 156 CLR 185, and in many subsequent decisions failed to take the opportunity to place specific constraints on the way in which trial judges determine property matters. However, the concept of stare decisis warrants further focus in order to identify the ramifications that a departure from stare decisis has for the present study.

Wassestrom (1961) identifies three types of stare decisis which Lawler (1964) expands upon and illustrates: traditional, local and personal.

- *Traditional stare decisis.* The same, equivalent or more favorable fact pattern in the same or higher Court leads to the same decision. It is this kind of stare decisis that Kovacs (1992) and Ingleby (1993) claims has not occurred fully in family law because the High Court of Australia has failed to lay down specific constraints for trial judges to follow.
- *Local stare decisis.* The same, equivalent or more favorable fact pattern in the same Court leads to the same decision. This manifests in family law as a desire for Family Court judges to exercise discretion in a manner that is consistent with other judges of the Court.

- *Personal stare decisis.* The same, equivalent or more favorable fact pattern found by the same judge in different cases leads to the same decision. This manifests in the Family Court as the tendency an individual judge has to be consistent with the way he or she exercised discretion in past, similar cases.

Lawler (1964) reminds us that predicting the outcome of a case cannot be possible without the concept of stare decisis. Furthermore, the ability to predict an outcome with some accuracy is important if law is to be respected within a community. Although, family law in Australia has been controversial, by and large, outcomes in property proceedings can be predicted with some degree of accuracy by practitioners experienced with the way in which the Court and individual judges exercise discretion. We take the view that the predictability must be the result of local and personal stare decisis because traditional stare decisis is not dominant.

The decomposition of the concept of stare decisis into traditional, local and personal has an impact on KDD because it is associated with a conceptualization of judicial error. Cases that are exposed to data mining algorithms must be those in which a judge has not erred, otherwise the data mining algorithm will learn incorrect or unacceptable patterns. In domains characterized by traditional stare decisis a judge can err by failing to follow the ratio laid down by superior or equal Courts. In domains characterized by personal and local stare decisis, judges err by failing to be consistent with other judges currently in the same Court or with themselves in earlier like decisions. In the next section we discuss judicial error in greater detail to demonstrate that judicial consistency is not easily measured but statistical metrics are appropriate where the stare decisis is local/personal.

4 Judicial error: the first ramification of non-traditional stare decisis

A conceptualization of judicial error is important for the application of KDD to legal reasoning because the goal of a such a system is to predict outcomes that actual judges will consider acceptable. Performance of the algorithms can be expected to degrade if exposed to large numbers of decisions in which a judge has erred. This raises significant jurisprudential and pragmatic problems. How are we to determine whether an actual judicial outcome is an unacceptable exercise of discretion? To what extent can two judges offer divergent decisions on cases with identical findings of fact before one (or both) is considered to have erred? Furthermore, to which authority should we turn, to make this determination? We shall first discuss the issue of which authority is best placed to make a determination on acceptable bounds of discretion.

The most obvious authority for the discernment of acceptable from unacceptable exercises of discretion are appellate courts. However, this authority is not suitable in family law because very few cases are appealed to higher courts. An appeal to a higher court is expensive and the possible gain may not warrant the additional expense. Furthermore, a demonstration that a relevant factor was not given appropriate weight by a trial judge is extremely difficult because standards for the exercise of discretion in family law have not been laid down by the High Court. Experienced practitioners typically advise against an appeal unless a decision was plainly unjust.

Schild (1995) explores these issues and suggests the establishment of panels of experts specifically formed to provide feedback and specific con-

straints to Israeli judges to ensure more consistent sentencing. Panels such as those advocated by Schild (1995) do not exist in Australian family law. In order to ensure that only cases that reflect an acceptable exercise of discretion are included in the training sets, we first identify those cases that are inconsistent with other cases. The criteria for inconsistency used is essentially statistical and is described in Zeleznikow and Stranieri (1997). Those cases that contradict each other according to our statistical criteria are removed from the training set.

A fundamental assumption we make is that judges can and do err to some extent and that their errors are not necessarily detected or reversed by an appeal to a higher court. However, this calls into question the nature of judicial error. The concept of judicial error is not dealt with directly by major theoretical movements in jurisprudence. However, the conceptualization of judicial error can be seen to depend to some extent on the jurisprudential perspective held. For utilitarians, an error in legal reasoning no doubt occurs if a judge determines an outcome which cannot be seen, in the short or long term, to uphold principles of utilitarianism. For adherents to the model of legal reasoning proposed by Dworkin (1977), a judge errs by failing to discover the 'ideal' way to apply precedents to a current fact situation. For legal positivists, a judge may err by failing to discern a core from a penumbra case, and by failing to apply appropriate rules to resolve a current penumbra case. For German conceptualists, a judge errs by failing to reason deductively from fact to conclusion.

Our view of judicial error is essentially empirical. In domains that are not appreciably discretionary in the way that family law is, it could be said that if two judges arrive at different conclusions after a finding of identical facts then they are using different legal principles or standards. However, as illustrated above, two judges in family law could conceivably agree on the facts of a case and also on the appropriate legal principles yet still reach different conclusions.⁴ If it were possible to expose a large number of judges to the same set of facts, then we can imagine that a mean outcome would emerge and individual judgements would fall on, or on either side of the mean. This enables us to set boundary lines between acceptable and unacceptable exercises of discretion on empirical grounds.⁵

The adoption of an empirical conceptualization of error is an important ramification that is justified for local and personal stare decisis though is not readily appropriate for traditional stare decisis. Errors in traditional stare decisis are intimately associated with open texture in the form of classification ambiguities and/or defeasible rules and require more than an empirical analysis.

Another ramification for the application of data mining to *shopping list* statutes relates to the types of cases suitable for application with data mining algorithms. This is described in the following section.

4 Judges attempt to ensure their own personal and local stare decisis by meeting frequently in informal chambers to discuss cases. New judges decisions are vetted by experienced judges during a probationary period. New judges spend time in each registry of the Court around Australia. These mechanisms attempt to ensure consistency of outcome from one judge to another.

5 The actual criteria used in the KDD exercise reported in Zeleznikow and Stranieri (1997) involved defining KDD training set examples (subsets of fact situations from cases) that had identical inputs and different outcomes as errors. A simple empirical difference metric was devised to quantify difference. All contradictory examples were removed.

5 Types of cases for KDD: the second ramification

Ingleby (1993) suggests that the vast majority of cases that come before the Family Court are not extraordinary. They do not involve extraordinary facts, do not have outcomes that are unexpected and are, consequently rarely reported by Court reporting services. Zeleznikow *et al* (1997) call these commonplace cases and distinguish them from landmark or leading cases. In domains where traditional stare decisis is emphasized, any case that is currently viewed as commonplace could be used in the future as a landmark case. This blurs the distinction between landmark and commonplace cases. However, in domains where traditional stare decisis is not strongly adhered to, if a case is regarded as commonplace at the time of decision, it is extremely unlikely to be cited in the future and even less likely to be invoked as a landmark case. The impact an ordinary case has, is to add to the body of cases for personal and local stare decisis.

Commonplace cases are suitable for the discovery of knowledge about how judges exercise discretion in family law, whereas landmark cases are not suitable. Commonplace cases build up a repository of experience from which local and personal stare decisis is exercised. KDD is useful in modeling local and personal stare decisis so therefore commonplace cases are more appropriate. Landmark cases typically revolve around a definitional issue or they attempt to resolve a classification ambiguity so that a precedent for subsequent cases may be set.

Hunter (1994) indicates that most early applications of neural networks to law in the past used landmark cases. For example, Hobson and Slee (1994) used a series of leading cases in British theft law to train a network to predict a courtroom outcome. Results they obtained highlighted flaws in the use of neural networks in legal reasoning. However, we agree with Hunter in noting that their results are partly due to the use of landmark cases rather than common place cases. As such, it is incorrect to dismiss the connectionist paradigm for legal reasoning.

The distinction between commonplace and landmark cases is not one based on clear definitional categories since any case that is currently viewed as commonplace could conceivably be used in the future as a landmark case. For example, perhaps the most significant leading case in family law, *Mallet vs Mallet* was not particularly extraordinary at the first instance court. We invoke a concept of 'interesting' in order to guide the discernment of a commonplace case and note that, to us, if a case is not interesting, it is a commonplace case.⁶ For a first instance decision to be interesting it must:

- be appealed, or
- introduce a new category of fact e.g. intellectual property, or
- include a new principle, rule or factor in its ratio decidendi, or
- exhibit an outcome vastly at odds with other similar cases.

The concept of 'interestingness' of a case can be operationalised relatively easily by noting that senior judges of the Family Court make precisely this sort of judgement in deciding which cases are to be published by Court reporting services. These services do not publish the judgements of all cases because the majority of cases are of little interest to readers. Thus, the more

6 This is not the same as the concept of *interestingness* in KDD which refers to the degree of support and confidence displayed by an association rule discovered with algorithms such as *Apriori*.

appropriate cases from which to extract data for inclusion in a training set are unreported cases. These cases are those in which a senior judge of the Family Court has ruled as uninteresting.

6 Conclusion

Knowledge discovery from database (KDD) can particularly be usefully applied to modeling judicial reasoning in discretionary domains. However, this calls into question the concept of discretion. We view a discretionary domain as one in which a decision maker has considerable flexibility in assigning relative weights to factors stipulated by statute or precedent to be relevant. Furthermore, the presence of discretion introduces a situation that characterizes law as open textured. Discretion is not the same as other situations that Prakken (1993) has identified as representative of open texture, namely classification ambiguities, defeasible rules or vague terms. We view discretion as a distinct type of situation that contributes to the characterization of law as open textured.

The discretion involved in weighing up a list of factors is a distinct open textured situation because local/personal stare decisis dominates traditional stare decisis. Family law in Australia is noted for its lack of traditional stare decisis. Yet outcomes are predictable because local/personal stare decisis is effective. KDD is suitable for shopping list discretion because it is particularly well suited to modeling local/personal stare decisis. However, this has two ramifications for KDD.

The first ramification involves defining judicial error in an empirical way. Errors in the application of local/personal stare decisis occur when an outcome is inconsistent with others to an unacceptable degree. Limits of unacceptability cannot be defined according to precedent or principle as in traditional stare decisis so must be defined in another way. Panels of experts to determine acceptable exercises of discretion as advocated by Schild (1995) do not exist in Australian family. A metric which is essentially empirical can therefore be used.

The second ramification involves the use of commonplace cases for KDD rather than landmark cases. Local/personal stare decisis is built up by the mass of ordinary cases whereas new precedents or principles for traditional stare decisis are established by landmark cases. The distinction between commonplace and landmark cases can be operationalised easily by taking those cases senior Family Court judges regard as sufficiently interesting to publish as landmark cases.

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