

A Dialogical Model of Case Law Dynamics

Trevor Bench-Capon and John Henderson

Dept of Computer Science, University of Liverpool, UK

Abstract. We describe a set of dialogue moves which give a procedure to model the development of case law over a sequence of cases.

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1. Introduction

In [6] we discussed how case law develops as new cases arise. Our account was based on [8]. In this paper we take the ideas further, and provide a more precise account in the form of a set of dialogue moves. Current understanding of the domain is expressed as one or more rules, based on previous decisions. The existing rules will provide a reason to decide in accordance with them, but the other party can propose a counter argument based on a modification of the rules. This should be, as far as possible, consistent with previous decisions. If the counter argument is accepted, a refined understanding of the law will be expressed using the modification. In this way the theory may be reconstructed in the light of each new case to express an improved understanding.

We will first set out the machinery of our model, and the set of dialogue moves we have developed. These moves have been applied to an example based on the fictional area of law described in [6]. The example with a sequence of sixteen cases is given in full in the longer version of this paper [4] available at <https://cgi.csc.liv.ac.uk/research/techreports/>. The applicability to real cases was illustrated by the discussions in [6] of the thread of cases from [8] and some US 4th Amendment cases.

2. Elements of the Model

Throughout this paper we will give illustrations based on the example of [6], a fictitious welfare benefit, called *Independence Allowance* (IA). IA is paid to enable a measure of financial independence to those who are not expected to work.

As with HYPO [1], we represent cases as a set of facts. Facts are predicates of arity 1, and the domains may be boolean, an enumerated set of values, or a specified numeric range. The six facts used in the example are shown in Table 1.

Table 1. Factual Predicates. Sentence is a prison sentence: for non-prisoners it will be 0. If not yet entered workforce, value for entered workforce is age +1

Predicate	Domain	Predicate	Domain
Age	0-130	Apprentice	Yes,No
Sentence	0-30	Absence	0-130
Current Education	Primary, Secondary, College, University, No	Entered Workforce	12-130

Table 2. Factors for Independence Allowance. Vague factors have an upper and lower bound.

Factor	Rule
Infant	Age < 5
Child	Age < 16(low)/19(high)
PrimarySchoolchild	Current Education is Primary
Schoolchild	Current Education in {Primary, Secondary, College}
AgeofConsent	Age \geq 16
Minor	Age \geq 18
BelowSchoolLeavingAge	Age < 19
Young Adult	Age \geq 18 AND Age < 30(low)/35(high)
Elderly	Age \geq 60(low)/80(high)
Pensionable	Age \geq 66
DeemedRetired	Age \geq 72
Prisoner	Sentence > 0
Short Stay Prisoner	Sentence < 1
Full Time Education (FTE)	Current Education in {Primary, Secondary, College, University}
Continuing FTE	Current Education in {Primary, Secondary, College, University} AND Entered Workforce > Age
Apprenticed	Apprentice = True
AbsenceDegree	Moderate if Absence/Age > 0.5: Substantial if Absence/Age > 0.8

Like [1] these facts can be mapped to factors using simple rules as shown in Table 2. These factors are intended to pick out potentially legally significant patterns of fact. For non-boolean facts we follow [9], so that where we have a dimension such as age or education, the factors identify points or ranges on that dimension. Some factors, like *child*, may lack precise bounds.

A rule will comprise a set of factors as antecedent, a *positive* outcome (to reflect the burden of proof) as consequent, and sets of positive exceptions and negative exceptions. Positive exceptions have a positive outcome despite the antecedent not being satisfied, and negative exceptions have a negative outcome despite the antecedent being satisfied. Each exception will be a set of factors.

3. Procedure

When the first case has been decided, the *ratio* of that case will offer a reason (as in the *reason model* of [9]) why the case was so decided. From this reason a rule can be derived, to be applied to future cases. This reason will be more general than the particular facts of the case and the terms used as the reason factor might be vague like *child*, or precise (at any given time) like *minor*.

Given a rule, a new case will either satisfy the rule, fall under a positive exception, fall under a negative exception, or be inapplicable. If it satisfies the rule or a positive exception that will be an argument for the positive side; if it satisfies a negative exception that will be an argument for the negative side. If no rule is applicable there is a “negation as failure” argument for the negative side. Although following the rule would apply the existing theory, the theory must be reconsidered in the light of the new case. There will therefore be a number of ways to respond by proposing modifications to the theory. We will now describe the responses and the rebuttals of these responses for each of the four situations. This gives a three-ply argumentation structure, which is commonly used in legal reasoning with cases, e.g. HYPO and its descendents [3].

3.1. First Ply

There are four possible moves here, two for the claimant and two against:

- ApplyRule(R). This can be played if there is a rule R for which the antecedent is satisfied by the new case. It argues for a positive outcome.
- ApplyPosException(R,E,V). This can be played if there is a rule R with a positive exception E which is satisfied by the new case. V is the value promoted by the exception. It argues for a positive outcome.
- ApplyNegException(R,N,V). This can be played if there is a rule R with a negative exception N which is satisfied by the new case. Again V is the value promoted by the exception. It argues for a negative outcome.
- NoRule. This can be played if there is no rule for which the antecedent is satisfied by the new case. It argues for a negative outcome.

3.2. Second Ply

The responses here will depend on the move made in the first ply.

3.2.1. ApplyRule, ApplyPosException and ApplyNegException

There are a number of possible replies. The same replies can be used for all three of these first ply moves.

- DoesNotApply(R/PosEx/NegEx,Factor,NewFactor,V). This can be used if a factor in the rule, positive exception or negative exception is vague, and the case falls within the “penumbra of doubt”. The respondent will propose a replacement *NewFactor* falling within the range of *Factor*, but such that the rule/positive exception/negative exception no longer applies (e.g. replace *child* with *ageOfConsent* for a 17 year old). V is the social value that would be promoted by adopting the new factor.
- ProposeException(R, Factor,V). This is used if there is a factor in the new case not present in the previous cases to which the rule applied. It proposes that factor as a negative exception for ApplyRule and ApplyPosException and as a new positive exception for ApplyNegException. V suggests a social purpose which would be advanced by adopting the exception.

- $\text{Narrow}(\text{R}/\text{PosEx}/\text{NegEx}, \text{Factor}, \text{NewFactor}, \text{V})$. This prevents the rule, positive exception or negative exception from applying by proposing to replace *Factor* with *NewFactor* in the antecedent/positive exception/negative exception. *NewFactor* may be a smaller range of the same dimension as *Factor*, or require an additional fact to hold, (e.g replacing *FTE* with *Continuing FTE* from Table 2). It is argued that the narrowing would serve some social purpose, *V*.
- $\text{Broaden}(\text{NegEx}, \text{Factor}, \text{NewFactor}, \text{V})$. For *ApplyRule* this enables a negative exception to apply by broadening a factor in that negative exception. *NewFactor* may be a larger range of the same dimension as *Factor*, or remove a fact from the definition of *Factor*. It is argued that the broadening would serve some social purpose, *V*.

3.2.2. *NoRule*

ProposeException and *Broaden* can also be used here, by enabling an existing rule to apply, and there are two new moves.

- $\text{NewRule}(\text{R}, \text{V})$: This argues that a new rule is required for cases of this type. *V* suggests a social purpose which would be advanced by recognising the new type. As for all rules the outcome is positive.
- $\text{ProposeException}(\text{R}, \text{Factor}, \text{V})$. This can be used if there a factor in the new case which was not present in the previous cases, to enable a positive exception to the rule to apply. It proposes *Factor* as a positive exception. It differs from *NewRule*, in that the case is seen as an exception, rather than as a new, distinguished, group of cases.
- $\text{Broaden}(\text{R}/\text{PosEx}, \text{Factor}, \text{NewFactor})$: This enables a rule or positive exception to apply by broadening a factor in the antecedent/positive exception. *NewFactor* may be a larger range of the same dimension as *Factor*, or remove a fact from the definition of *Factor*.
- $\text{Analogy}(\text{R}, \text{Factor1}, \text{Factor2}, \text{Similarities})$: This contends that, on the basis of some similarities, a new factor, *Factor1*, is sufficiently analogous to an existing factor in the rule, *Factor2*, that they should be treated the same.

3.3. *Third Ply*

Each of these responses can be met with rebuttals. To rebut *DoesNotApply* the rebutter needs to include the case in the range of the factor in the antecedent.

- $\text{RuleDoesApply}(\text{Factor}, \text{NewFactor2}, \text{V2})$. Where *NewFactor2* is an alternative replacement for *Factor*, which does include the new case (e.g. *minor* rather than *ageOfConsent* for a 17 year old). *V2* is the social value promoted by adopting the proposed new factor, and it is argued to be preferred to the value promoted by the factor proposed in the response.

For the moves depending on a value, *ProposeException*, *Narrow*, *Broaden* and *NewRule*, the rebuttal will turn on the desirability of promoting the value. A rebuttal can therefore deny that it does promote this value, or put forward a preferred value which the proposal would demote.

- NoPromotion(Factor,V): The proposed exception would not promote the desired value.
- Demotion(Factor,V2): The proposed exception would demote *Value2*, which is preferred to the value promoted according to the response.

For *DoesNotApply*, *NewRule* and *ProposedException* a rebuttal based on precedents can be used. If existing negative instances satisfy the new factor or the proposed rule, or positive instances contain the proposed exception, precedential constraint [7] excludes the proposed exception.

- Precedent(R/Exception,C): The proposed rule or exception was not applied in a precedent case, C.

When the response involves broadening or narrowing, an alternative rebuttal will contend that the proposed movement is too great to be acceptable.

- TooGreat(Factor,NewFactor). *NewFactor* would entail too great a movement and so *Factor* should continue to be used.

The final response is *Analogy*. To rebut this move, it is necessary to cite differences which make the proposed analogy unacceptable.

- NoAnalogy(Factor1,Factor2,Differences). *Differences* are the differences between the proposed new factor and the existing factor.

For example, if *father* was proposed as an analogy to *mother*, gender would be a difference, and might or might not be considered significant,

3.4. Resolution

After three plies a decision has to be made whether to stay with the original rule or to accept the modification. This will be a matter for argument, as in the Justices' Conference in the Supreme Court. Modelling these arguments is, however, outside the scope of this paper, which is intended to describe the public proceedings. The nature of the decision will depend on the type of the rebuttal. *RuleDoesApply*, *NoPromotion*, and *Demotion*, all turn on a value judgement (see e.g. [5]). Here the judges much choose which purpose or value they wish to promote. The preferred values are intended to reflect what [8] called the "common ideas of society", and may change over time, to adapt the law to changing social attitudes.

Precedent is a powerful rebuttal and should, given a strict interpretation of *stare decisis*, normally succeed. Sometimes, however, a precedent is not followed or even explicitly overruled: either it is too old and no longer represents the "common ideas of society", or it may be anomalous and conflict with other precedents, or perhaps a new value, not considered in the precedent, has subsequently emerged. In such cases the judge must decide whether there are sufficient grounds to disregard the precedent (see the discussion of *Robbins v California* in [6]).

TooGreat requires the judge to consider whether the proposed broadening or narrowing is too great a step to be acceptable, even if permitted by precedents [9]. Here the judge must come to a view on what seems appropriate.

Finally, *NoAnalogy* requires the judge to decide whether the similarities or the differences are more persuasive in the context of the case. A discussion of these matters can be found in [2].

A fully worked example stepping through a sequence of sixteen cases concerning Independence Allowance and an extended discussion is given in [4].

4. Concluding Remarks

Is automating the procedure feasible?. The first ply is straightforward: checking where a rule or exception applies is simple. The second ply is a little less straightforward. If a rule is applied, identifying a factor with questionable bounds, or factors that would represent a narrowing or broadening to exclude or include the case is easy, but identifying the rationale for these modifications is not. Similarly identifying a factor that *could* serve as an exception is easy, but whether the proposal would be sensible or not requires genuine understanding of the domain. Exceptions, broadenings and factors that would provide useful analogies or antecedents to new rules can be identified, but some semantic understanding is required to judge whether it would be worth advancing them. In the third ply, identifying whether there is a factor that would include the new case to allow *RuleDoesApply* is easy. Similarly discovering a precedent is not a problem. However, identifying differences for *NoAnalogy*, or that a value is not promoted or demoted requires a proper understanding of the terms [2]. That a broadening or narrowing is too great can always be argued, but judgement is required to form a view as to whether the claim is likely to be successful.

Thus two kinds of knowledge are required: knowledge about the rules, cases and background factors is precise and can be used to automatically suggest legally possible moves. Selecting the best move and assessing its worth, however, requires a far deeper understanding of the domain, of a sort that would require a comprehensive ontology. Fortunately such an ontology already exists in the heads of lawyers. This suggests that the proposed system should be designed as a support system, making suggestions as to the possible moves, which then require selection and justification with values by the user.

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