

UNIVERSITY OF LIVERPOOL  
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# First Year PhD Project Report

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# 1 Introduction

The human reasoning process used in conducting arguments to resolve conflicts and reach a decision is an interdisciplinary study. Modelling argumentation has a great impact on the development of theories and applications in AI especially in critical domains that involve richness of reasoning such as Law. Therefore, argumentation has been recognised as a core topic in AI and Law. Developing computational argumentation systems that stimulate legal reasoning requires resolving distinctive challenges that concern contextual rules, procedural issues and the interpretation of different elements.

The first stage of this PhD research aims to provide a supportive computational model for analysing stages in the Supreme Court starting from the oral hearings. In particular, a key aim is analysing the social values of the legal arguments from different perspectives, and finding the relation between the Court opinion and the components constructed in the Supreme Court oral hearings.

This report gives an overview of the current PhD research proposing the overall aims in the first section, followed by a summary of the background in argumentation in AI and related work in argumentation in AI and Law. Finally, I present the deliverables obtained at this stage and my vision for future work in the last two sections.

# 2 Research Aims

The main aim of the first part of this PhD research is to investigate how computational support can be developed to *analyse* dialogue interactions in various Supreme Court stages starting from the oral hearings, and what are the *effects* of this analysis on the Court decision.

In comparison to other contexts, dialogues in the legal domain combine arguments from different sources, i.e. argument about the case evidence and facts, argument from legal rules, argument from precedent cases, argument from hypothetical tests and others which are required to resolve the ambiguity of the conflict issues. However, the structure of exchanging arguments in legal dialogues is not clear, the argument types are interleaved and there is no particular order for the parties to pose arguments which makes the analysis of the oral hearings more complicated. Furthermore, coming to a decision in a legal case dialogues is a separate process that requires legal analysis in order to derive the case facts, apply the facts to the current law, which intended to reflect the values of society, and announce the decision that is limited to two outcomes (deciding for plaintiff and decide for defendant), in a form of Court opinion that explores the arguments supporting the decision. Modelling these aspects provide challenges in the computational development in the domain of AI and Law.

Thus, in particular, this PhD research is initially attempting to fulfil the following aims:

- Define a representation for the U.S. Supreme Court oral hearing dialogues based on conflicts in social values.
- Provide a full analysis of the oral hearing dialogues by studying a particular legal case study using the defined representation.
- Define formal dialogue moves in terms of the pre and post conditions.
- Define a protocol for the oral hearings dialogue.
- Analyse the subsequent Court opinion arguments by finding the relation between the argument components that emerge from the oral hearings through selecting and justifying the options.
- Identify different dialogue strategies using the model and protocol, and show the effects of these strategies on the Court opinion.

### 3 Background Research

While argumentation is still considered a recent field in the AI domain, it has clearly shown a wide and rapid development in both theoretical and practical areas. To reach a comprehensive understanding of the research area, a general reading beginning from argumentation theory, argumentation schemes, abstract argumentation, argumentation frameworks and dialogues has been covered to enrich my knowledge in the main domain. Afterwards, a specific investigation on argumentation in the domain of AI in law covering argumentation in legal cases and legal reasoning models was required in the development of this research. The following sections demonstrate outlines of the research domain and previous works which this PhD research based is based on.

#### 3.1 Argumentation in AI

*Argumentation Theory* is the study of the process of making a decision through logical reasoning which itself involves different types of reasoning. Any argument structure consists of premises, a conclusion and a set of critical questions used to evaluate the argument. *Argumentation scheme* is one form of argument structure that captures stereotypical patterns of human reasoning in different contexts. A number of argumentation schemes have been introduced and analysed from studying cases in different contexts [1]. However, further work discusses the need of justifying argumentation schemes [2]. A recent investigation has distinguished between the types of argumentation schemes into those that are used as elements of a reasoning method, while another considered them as reasoning method [3].

*Dung's Argumentation Framework* (AF) [4] provides a fundamental development that enables arguments to be represented as abstract entities and evaluated computationally in terms of their ability to resist attacks [5]. Dungs framework

comprises arguments and binary attacks between the arguments and supplies a variety of acceptability semantics for the arguments. The abstract nature of Dung’s framework lends itself to further instantiations, both adding additional properties to arguments and providing structure for arguments [6]. An important approach based on an added property is the *Value based Argumentation Framework (VAFs)* [7] that *justifies* the choice of the acceptable arguments using preferences on an additional property of arguments described as the social value which each argument promotes, with the various value orderings being taken as characteristic of different *audiences* [8]. However, the preferences between values are not themselves justified in VAFs. Thus, a recent development [9] of Extension based Argumentation Frameworks (EAF) [10] rationalizes the choice between preferences by adding attacks from arguments to attacks between arguments. In the VAF context this means that it is possible to represent a preference as an attack on the attack between the conflicting arguments and give arguments to provide a meta-level justification for that preference.

In practice, argumentation is often presented as synchronous interactions through different types of dialogues classified by Walton and Krabbe [11] as persuasion, deliberation, negotiation, inquiry, information-seeking and eristic, each of which has some sub-types. These dialogue types characterise the speech acts and provide the context to interpret them. Thus, in developing dialogue systems, it is important to be aware of the type of the dialogue, since shifts between dialogue types often lead to misunderstandings and fallacies. Walton and Krabbe characterise dialogue types according to

- The dialogue *initial situation* which identifies the initial conditions that give rise to the dialogue.
- The dialogue *overall goal*, shared by all participants, which defines the characteristics of a successful dialogue outcome.
- The *individual goals* of the participants which help to determine the reasons for particular move choices by the participants which should lead towards the main goal, while at the same time respecting their own best interests.

Dialogue systems are rule-governed systems, e.g. [12] clarifies the interaction rules between the participants in persuasion dialogues. Following Hamblin and Mackenzie, I can term these *dialogue games* [13, 14]. For each dialogue game, a mechanism must be defined to select which argument to assert or attack at each step of the dialogue, to determine the acceptability of the arguments which have been put forward and to identify the different terminations of the dialogue. Several properties are defined for such games, such as whether the game always terminates and whether the outcome is always optimal.

## 3.2 Argumentation in Case Law

In a narrower study, extensive work has enriched the domain of argumentation in AI and Law over the last 25 years [15]. The nature of legal dialogues emerge different types of arguments which result in different types of argumentation schemes such as argument from analogy, argument from expert opinions, argument from rules and others. These argumentation schemes are used extensively in modelling legal reasoning; further explanation about reasoning models is presented in section 4.2. Before that, I will give a brief introduction about the procedure in U.S. Supreme Court since this is the settings for my research. *Note: further detailed references can be found in the paper in Appendix A*

### 3.2.1 U.S. Supreme Court Procedure

Typically the Supreme Court reviews cases that have been decided in lower courts and either affirms or reverses the lower courts decision. The Supreme Court receives a number of *certiorari* requests from parties who are not satisfied with the lower Court decision asking for a review of their cases. Normally, when a case for consideration of *certiorari* is accepted, the petitioner and respondent write briefs setting out their positions and recommendations to prepare the Justices for the oral argumentation. Briefs may also be supplied by other interested parties, such as the solicitor general. These are the so-called *amicus curiae* (friend of the Court) briefs. When the justices have considered all the briefs, the oral hearings take place. The total time for the oral argumentation is just one hour, thirty minutes for each party. Normally the petitioner will begin, reserving some of his thirty minutes for rebuttal. The respondent will follow for thirty minutes, and the petitioner will finish taking the remaining time for a rebuttal. Following the oral hearings, the justices meet in a justice conference to discuss and vote on the case. Following this the opinions are prepared: one justice will be chosen to write the opinion of the Court, and the other justices may, if they wish, write their own concurring or dissenting opinions.

The Supreme Court is expected to give a decision in the case under review, but they need to look to the past and the future as well. Their decision needs to be expressed as a rule which will be applicable to future cases, and which will, as far as possible, be consistent with previous decisions of the Court.

## 4 Research Findings

The first phase of this research was to define a *representation* for the legal statements exchanged in oral hearings that is appropriate to provide the full analysis required to fulfil the research aims. To do so, I studied the nature of the arguments exchanged in the oral hearings of the U.S. Supreme Court starting first from examining the procedure of the U.S. Supreme Court in order to determine the sources and the outcome of the oral hearings and final Court opinion. Then, I investigate the type and characteristics of the nested dialogues involved within the main oral hearings dialogue. After that, I select *California*

*v. Carney* as a particular legal case study to define a representation for the elements of arguments in the oral hearings transcript of the case and show how this representation would help in forming the arguments of the Court opinion. Toward this representation, I have examined number of representations and reasoning methods and define a new representation based on constructing *tree of elements* from the oral hearings which shows the relation between the *issues* on the roots of the tree down to the case *facts* on the tree leaves through number of *factors* linked between the issues and facts.

The outcomes from this stage have been presented in the attached paper (Appendix A) which has been accepted in the 13th workshop of Computational Models of Natural Arguments (CMNA) on June 2013. The following sections explain these results briefly.

#### 4.1 Dialogues in Oral Hearings

Recall that as part of the Supreme Court procedure, there are three nested dialogues in the main oral argumentation dialogue. Each of the three dialogues will involve a counsel and nine justices. I will not distinguish between the justices here. Prior to analysing the arguments in the oral hearings dialogues, I will describe the initial situation, the individual goals and the collective goal for Oral hearings accordingly.

In the *initial state* of the petitioner presentation, briefs from the petitioner, respondent and any "friends of the Court" are available. These will set out (and justify) a set of tests forming candidate arguments: the arguments of each counsel will, if accepted give rise to a decision for their clients. These briefs will also state the accepted facts of the case, and draw attention to relevant precedent cases. The *collective goal* is to obtain a clear statement of the argument for the petitioner. Individually *the counsel* will wish to state his argument and answer any critical questions satisfactorily: modifying his tests if necessary. *The justices* will wish to clarify any points that had not been made clear in the original brief, and to pose challenges arising from other briefs.

The *collective goal* of the second dialogue, the respondent presentation, is to obtain a clear statement of the argument for the respondent. The respondent dialogue differs in its *initial state* because the petitioner has already presented. Thus as well as presenting his own argument, *counsel for the respondent* may wish to rebut the argument proposed by the petitioner, and so will have the goal of questioning the petitioner's argument as well as presenting his own argument. *The justices* remain interested in clarification and eliciting answers to questions arising from the other briefs.

While the *collective goal* of the rebuttal dialogue is again a clear statement of the arguments, the *initial state* now also contains the respondent's argument and the individual goal of *the counsel* is to pose questions against this argument. *Justices* usually say very little during this stage, but they may seek clarification of the exact questions being posed.

The goal of the three dialogues together is to provide a clear statement of the arguments for the petitioner and the respondent to provide a basis for the

justices to decide the case.

## 4.2 Model of Reasoning

Modelling reasoning with legal cases has been a central topic of AI and Law from the beginning, and there is now a good degree of consensus, especially with regard to the main elements involved. This consensus can be expressed as a tree of inference with a legal decision as the root and with evidence as the leaves. Between the two there are a number of distinct layers.

Immediately below the decision there is a level of issues [16], or values [17], which provide the reasons why the decision is made. The idea here is that laws are made (and applied) so as to promote social values: whether a value is promoted or not is an issue. Where more than one value is involved and they point to different decisions, the conflict needs to be resolved. Sometimes it is appropriate to give priority to one value over another (as in [17]), sometimes a balance needs to be struck (as in [16]). Note that the relation between issues may be seen as a matter of ordering, or requiring a balance between the values: there is as yet no consensus on this point [18].

At the next level down there are a number of *factors* [19]. Factors are stereotypical fact patterns which, if present in a case, favour one side or the other by promoting a value, and so are used to resolve the issues and permit comparison between the cases. Sometimes (as in [19]) it may be convenient to group several factors together under more abstract factors, so that we may have two or three layers of factors, moving from the base level factors through more abstract factors, before reaching the issues.

Below the factors there are the fact patterns used to determine their presence. These facts supply reasons for and against the presence of the factor which need to be considered and weighed to make a judgement.

At the lowest level there is the evidence. Facts are determined by particular items of evidence, and where evidence conflicts a judgement will need to be made: often this judgement is made by a jury of lay people rather than lawyers. In the lower courts there will be real items of evidence, but by the time a case reaches the Supreme Court, the facts are usually considered established and beyond challenge.

Thus a complete argument for a case will comprise a view on what can be considered as evidence for relevant facts: what facts are required to establish the presence of various factors, and how they relate; how the factors can be used to determine the issues; and, where issues and values conflict, how these conflicts should be resolved. In the next section I will show how these elements relate to the individual and collective goals of the oral hearing dialogues.

### 4.2.1 Dialogues Moves in Oral Hearings

The goal of the dialogues is to establish the various elements, and the connections between them, expressed as clearly and unambiguously as possible, which can be used by the justices in constructing the tests that will provide arguments



to resolve the case. Moves will thus enable the proposal of these elements, and a set of critical questions challenging the elements, or seeking additional elements. These moves represent the assertions of values, issues and relations between the issues, the assertions of factors relating to the issues, and the assertions of facts related to factors (each move is illustrated in examples from a case study in the attached paper).

In order to construct *tests* from these elements, ten critical questions have been identified. These questions relate to the *test too broad* and *test too narrow* arguments of [20]. The details of the moves, critical questions and tests are explained in the attached paper.

In the course of the hearings the various elements of the proposed tests emerge. The dialogue is often not well structured: the questions are not posed in any particular order, and may be interleaved with the presentation of the proposal, so that the proposal is modified as it is presented. None the less, the aim of each counsel is to present and defend the elements required for a test which will decide the case for their client, and the justices aim to get a clear statement of the various elements which they can use to build the arguments in their opinions.

#### 4.2.2 Case study: California v. Carney

*California v Carney* has often been used in AI and Law to explore Supreme Court oral argument, and to consider the interaction of two competing values: enforceability of the law, which makes *exigency* important, and citizens' rights: here, *privacy*. The case is concerned with whether the exception for automobiles to the protection against unreasonable search provided by the Fourth Amendment applies to mobile homes, in particular motor homes in which the living area is an integral part of the vehicle. That is, the Fourth Amendment exists to protect *Privacy*, and the automobile exception to enable *Law Enforcement*.

In a particular case the issues will be whether there was *sufficient exigency* and/or *insufficient* expectations of *privacy*. Using the set of moves proposed above, I have analysed the oral hearings of California v. Carney: Extracts from each of three component dialogues, showing the moves proposed and some critical questions posed against them are illustrated in the attached paper.

## 5 Research Plan

Following the results obtained so far, the research will continue towards the proposed aims. At the moment, I am performing a complete analysis of the oral hearings using the defined representation method. Throughout this analysis, I am intending to show the construction of the tree of elements by every move in the dialogue, and formalise the moves by showing the pre and post conditions. Furthermore, I will define a procedure that determines the *strength* of the dependency relation between the legal issues (using the relations between the elements of the tree). Taking in consideration that legal arguments propose

hypothetical tests to help in clarifying the case position on point of conflicts, I am intending to determine a function that returns *a dimension* for the proposed test. After that, I will propose *a protocol* for the oral hearings dialogue.

This analysis of the oral hearings will enable me to show the effect of the trees constructed throughout the dialogues in deciding the case by determining the tree paths and elements that play roles in the final Court opinion.

Following this analysis, I want to ensure that this model fits most of the legal cases, thus I am attempting to evaluate this model using different legal cases selected according to the degrees of similarities, i.e. starting from cases that are much similar to the case study then moving to less similar cases, and apply modifications where required. After this simulation evaluation, I will implement this reasoning model and protocol to enable me to evaluate my proposal.

Based on the evaluation results, I will define a number of dialogue strategies of the protocol, investigate these strategies using simulation of scenarios from different legal cases and empirically investigate implementations of the strategies in order to identify the best strategies.

Finally, I will combine the work elements together, *generalise* the proposed model and strategies and conduct an empirical evaluation and theoretical analysis on the final version.

The future work plan is presented in the program shown below. The work has been distributed according to the PhD time frame, where each phase of a year is considered as a project milestone.

## 5.1 Future work:

### 5.1.1 Year One: *May 2013-August 2013*

- Phase3:
  - Analysis of oral hearing dialogues using the construction of the tree of elements.
  - Define a formalisation of the dialogue moves.
  - Identify a procedure that determines the strength and nature of the dependency relation between the legal issues.
  - Define a function for evaluating the dimension of the proposed tests in oral arguments.
  - Analyse the Court opinion based on the trees constructed from the dialogues.
  - Define a protocol for the oral hearings dialogue.
- Deliverables and Activities:
  - June: Presenting paper at CMNA 2013 in Rome, Italy.
  - July: Attending and presenting a poster at Argumentation in AI Summer school at Kings college, London.

### 5.1.2 Year Two: *September 2013-August 2014*

- Phase1:
  - Evaluate the model and protocol using different legal cases.
  - Refine the model according to the evaluation results.
  - Implement the model and protocol.
- Phase2:
  - Define number of strategies based on the model and protocol.
  - Evaluate these strategies and select the appropriate one based on pre-defined criteria.
  - Determine the strategies specification and design analysis.
- Phase3:
  - Conduct a simulation evaluation on the selected strategies using a number of oral hearing scenarios.
  - Implement the strategies and test the software.
- Deliverables and Activities:
  - Writing a journal paper presenting the results from the full analysis.
  - Writing research paper(s) about the strategies analysis.
  - Developing Software of the implemented model.

### 5.1.3 Year Three: *September 2014-August 2015*

- Phase1:
  - Combine the protocol and strategies.
  - Apply the same tests again and record the results.
- Phase 2:
  - Define a generalised model based on the evaluation analysis.
  - Evaluate this model using the different tests and record the results.
- Phase 3:
  - Work on refinements and apply modification.
- Deliverables and Activities:
  - Writing a research paper(s) about the integration results.
  - Writing about the definition of the generalised model.

#### 5.1.4 Year Four: *September 2015-August 2016*

- Thesis Writing.

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## A Appendix: CMNA PAPER

# Dialogues in US Supreme Court Oral Hearings

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**Abstract.** Dialogue protocols in Artificial Intelligence and Law have become increasingly stylised, intended to examine the logic of particular legal phenomena such as burden of proof, rather than the procedures within which these phenomena occur. While such work has provided some valuable insights, the original motivation still matters, and so in this paper we will return to the original idea of using dialogue moves to model particular procedures by examining some very particular dialogues - those found in oral hearings of the US Supreme Court. We will characterise these dialogues, and illustrate the paper with examples taken from a close analysis of a case often modelled in AI and Law, *California v Carney* (1985). This paper presents the preliminary investigation required to identify tools to provide computational support for the analysis of oral hearings.

**Keywords:** Legal argumentation, persuasion, deliberation, values

## 1 Introduction

Dialogue games were originally introduced into AI and Law as a way of modelling legal procedures [8], but more recently they have been used rather to capture the logic of aspects of legal reasoning, such as reasoning with cases (e.g. [10]) or particular legal phenomena such as burden of proof (e.g. [11]), and in consequence have become somewhat stylised and unrelated to any particular legal dialogue. This work has produced some valuable insights, but in this paper we will return to the original motivation and consider some particular dialogues which form a clearly defined stage of the US Supreme Court process, namely the Oral Hearings stage. Our immediate aim is to present the preliminary investigation required to identify tools to provide computational support for the analysis of oral hearings: in the longer term we hope to provide a suite of tools to support other parts of the Supreme Court process.

We begin by providing some necessary background. We will recall the notion of dialogue types used in [13], briefly describe the Supreme Court processes and the role played by the oral hearings, and describe the particular case we will use as a running example, *California v Carney* (1985). The full transcript of the Oral Hearing and the opinions are available at [http://holmes.oyez.org/cases/1980-1989/1984/1984\\_83\\_859](http://holmes.oyez.org/cases/1980-1989/1984/1984_83_859).

## 1.1 Characterising Types of Dialogue

When analysing dialogues, it is important to be aware of the type of the dialogue, since shifts between dialogue types often lead to misunderstandings and fallacies; the dialogue types identify the speech acts available and provide the context to interpret them. Walton and Krabbe characterise dialogue types based on:

- The dialogue initial situation which identifies the initial conditions that give rise to the dialogue.
- The overall collective goal, shared by all participants, which defines the characteristics of a successful dialogue outcome.
- The individual goals of the participants which help to determine the reasons for particular move choices by the participant which should lead towards the main goal, while at the same time respecting their own best interests.

In section 2.1 we will identify the initial situation and goals appropriate to Oral hearings of the US Supreme Court, which will help to drive our analysis of the dialogues.

## 1.2 Supreme Court Process

Typically the Supreme Court reviews cases that have been decided in lower courts, either affirming or reversing the lower court decision. The Supreme Court receives a number of *certiorari* requests from parties who are not satisfied with lower court decisions asking for a review of their cases. Normally, when a case for consideration of *certiorari* is accepted, the petitioner and respondent write briefs setting out their positions and recommendations to prepare the Justices for the oral argumentation. Briefs may also be supplied by other interested parties, such as the solicitor general. These are the so-called *amicus curiae* (friend of the court) briefs. When the justices have considered all the briefs, the oral hearings take place. The total time for the oral argumentation is just one hour, thirty minutes for each party. Normally the petitioner will begin, reserving some of his thirty minutes for rebuttal. The respondent will follow for thirty minutes, and the petitioner will finish taking the remaining time for a rebuttal. Following the oral hearing, the justices meet in a justice conference to discuss and vote on the case. Following this the opinions are prepared: one justice will be chosen to write the opinion of the Court, and the other justices may, if they wish, write their own concurring or dissenting opinions.

The Supreme Court is expected to give a decision in the case under review, but they need to look to the past and the future as well. Their decision needs to be expressed as a rule which will be applicable to future cases, and which will, as far as possible, be consistent with previous decisions of the Court: see e.g. [9].

## 1.3 A case study: *California v Carney*

This case is concerned with whether the exception for automobiles to the protection against unreasonable search provided by the Fourth Amendment applies to



mobile homes, in particular motor homes in which the living area is an integral part of the vehicle. The Fourth Amendment protects the “right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures.” A search is considered reasonable if a warrant has been obtained. The exception for automobiles was introduced in the *Carroll* case in 1925, when a car carrying contraband was stopped and searched without a warrant. In *Carroll*, there is no mention of privacy: the justification was in terms of exigency, that the law could not be enforced if a warrant were required as the evidence would simply disappear into the night and another jurisdiction. The facts of this case (sedan on freeway) are as strong as can be in terms of exigency.

The notion of an automobile exception developed over the years through a series of cases, with elements of privacy being considered as well as exigency. *South Dakota versus Opperman* (1976) gives a clear statement incorporating the reduced expectations of privacy appropriate to automobiles in addition to exigency, and this statement of the exception was used as the current rule by the majority in *Carney*. In *Opperman* an illegally parked car was impounded and searched without a warrant. Marijuana was found in the glove compartment. Note that in *Opperman* there was no exigency at all.

*California v Carney* arose when drug agent officers arrested Carney who was distributing marijuana from inside a motor home parked in a public parking lot in the downtown of San Diego for unknown period of time. After entering the motor home, without first obtaining a warrant, the police officer observed marijuana. This motor home was an integral vehicle with wheels, engine, back portion and registered as a house car which requires a special driving license. On the other hand, it has some interior home attributes such as refrigerator, cupboard, table, scale, bag and curtains covering all the windows. The question was whether warrantless search was permissible in this case because satisfying the exception to the fourth amendment for automobiles. The California Superior Court *affirmed* the warrantless search because of the automobile exception. However, The California Supreme Court *reversed* the lower court decision indicating that the search violated the fourth amendment rule. After granting *a certiori*, The U.S. Supreme Court *reversed* the California Supreme Court decision stating that the search was reasonable and did not violate the fourth amendment rule.

*California v Carney* has often been used in AI and Law to explore Supreme Court oral argument (e.g. [12], [3]), and to consider the interaction of two competing values (e.g. [6]). In *Carney*, the competing values are enforceability of the law, which makes exigency important, and citizens’ rights, which include the right to privacy [5].

## 2 Models of Reasoning with Cases in AI and Law

Modelling reasoning with legal cases has been a central topic of AI and Law from the beginning, and there is now a good degree of consensus, especially with regard to the main elements involved. This consensus can be expressed as a tree

of inference with a legal decision as the root and with evidence as the leaves. Between the two we have a number of distinct layers.

Immediately below the decision we have a level of issues [7], or values [4], which provide the reasons why the decision is made. The idea here is that laws are made (and applied) so as to promote social values: whether a value is promoted or not is an issue. Where more than one value is involved and they point to different decisions, the conflict needs to be resolved. Sometimes it is appropriate to give priority to one value over another (as in [4]), sometimes a balance needs to be struck (as in [7]). Thus the Fourth Amendment exists to protect *Privacy*, and the automobile exception to enable *Law Enforcement*: in a particular case the issues will be whether there was sufficient exigency and/or insufficient expectations of privacy. Note that the relation between issues may be seen as a matter of ordering, or requiring a balance between the values: there is as yet no consensus on this point [5].

At the next level down there are a number of *factors* [1]. Factors are stereotypical fact patterns which, if present in a case, favour one side or the other by promoting a value, and so are used to resolve the issues. Factors are required to enable generalisation across the infinitely varied fact situations that can arise, and so permit the comparison of cases. Sometimes (as in [1]) it may be convenient to group several factors together under more abstract factors, so that we may have two or three layers of factors, moving from the base level factors through more abstract factors, before reaching the issues.

Below the factors we have the fact patterns used to determine their presence. These may offer necessary and sufficient conditions, but more often they offer either a set of sufficient conditions, or in less clear cut cases, a number of facts supplying reasons for and against the presence of the factor which need to be considered and weighed to make a judgement.

At the lowest level there is the evidence. Facts are determined by particular items of evidence, and where evidence conflicts a judgement will need to be made: often this judgement is made by a jury of lay people rather than lawyers. In the lower courts there will be real items of evidence, particular witness testimonies and the like. But by the time a case reaches the Supreme Court, the facts are usually considered established and beyond challenge. The Supreme Court does, however, need to consider what should count as evidence, and whether this will be generally available, so that the rule can be applied in future cases. For example a birth certificate is normally required as evidence of age, other evidence being considered unreliable, or unlikely to be available.

Thus a complete argument for a case will comprise a view on what can be considered as evidence for relevant facts: what facts are required to establish the presence of various factors, and how they relate; how the factors can be used to determine the issues; and, where issues and values conflict, how these conflicts should be resolved. In the next section we will consider the individual and collective goals of the oral hearing dialogues.

## 2.1 Oral Hearings

In this section we will describe the initial situation, the individual goals and the collective goal for Oral hearings in terms of the computational understanding developed in the previous section. As part of the Supreme Court procedure, there are three nested dialogues in the main oral argumentation dialogue. The overall aim is to establish the various elements, and the connections between them, expressed as clearly and unambiguously as possible, which can be used by the justices to construct the arguments they will use in their opinions. Each of the three dialogues will involve a counsel and nine justices. We will not distinguish between the justices here. Essentially they will all ask critical questions to clarify and challenge the argument elements proposed by counsel, although the particular questions they pose may well be motivated by their own views of the case, and their developing ideas of the argument they will use to decide the case. The arguments produced in the opinion will essentially use a *test*, which will be binding on future cases satisfying the test, and which will allow a decision to be made by using the facts of the current case, to establish the presence of a set of factors which will resolve the issues in favour of one of the parties.

In the *initial state* of the petitioner presentation, briefs from the petitioner, respondent and any “friends of the court” are available. These will set out (and justify) a set of tests which would provide candidate arguments: counsels will in turn present the elements of a test which, if accepted, will ground an argument for their clients. The briefs will also state the accepted facts of the case, and draw attention to relevant precedent cases. The *collective goal* is to obtain a clear statement of a set of elements which can form an argument which will resolve the case. Individually *the counsel* will wish to present an acceptable test which will lead to a decision for the petitioner and to answer any critical questions satisfactorily: modifying his tests if necessary. *The justices* will wish to clarify any points that had not been made clear in the original brief, and to pose challenges arising from the other briefs.

The *collective goal* of the second dialogue, the respondent presentation, is to obtain a clear statement of the test advocated for the respondent. The respondent dialogue differs in its *initial state* because the petitioner has already presented. Thus as well as presenting his own test, *counsel for the respondent* may wish to find some difficulties with the test proposed by his adversary. *The justices* remain interested in clarification and eliciting answers to questions arising from the other briefs.

While the *collective goal* of the rebuttal dialogue is again a clear statement of the tests and the elements composing them, and the choices that must be made when deciding between the tests, the *initial state* now also contains the respondent’s test and its elements and the individual goal of the petitioner’s *counsel* is to pose questions against this test. *Justices* usually say very little during this stage, but they may wish to seek clarification of some points.

The goal of the three dialogues as a whole is to provide a clear statement of possible tests and the elements used in them which the justices will employ to decide the case and construct the arguments in their opinions.

## 2.2 Dialogue Moves for Oral Hearings

The goals of the dialogues involve identifying the elements that can be used to construct tests that will provide arguments to resolve the case, and the relationships between these elements. Moves will thus enable the proposal of these elements, and a set of critical questions challenging the elements, or seeking additional elements. Thus, although there is no conclusion, and hence no argument as such, the moves have many similarities to those arise from argumentation schemes. In this section we describe the moves, (each illustrated with an example from *California v Carney*). Formal definition of these moves will form part of the specification of a computational tool which will be our next step.

- **Values Assertion:** The following values are relevant to decide the legal question. *Law Enforcement and Privacy are the values relevant to determining whether a case falls under the automobile exception.*
- **Issues Assertion:** The values are considered as these issues. *The issues are whether there was sufficient exigency (so that Law Enforcement is promoted) and insufficient expectations of privacy (to consider privacy) to permit a search without a warrant.*
- **Issues Linkage Assertion:** The issues should be considered collectively as follows. *The issues are related as Sufficient Exigency  $\vee$  Insufficient Privacy.*

We then have a number moves to introduce factors relating to the issues.

- **Factors for Issue Assertion:** The following factors are relevant to resolving the issue. *Vehicle Configuration and Location are relevant to resolving Sufficient Exigency.*
- **Factor Linkage Assertion:** The factors relevant to the issue should be considered collectively as follows. *Sufficient Exigency is resolved by considering Vehicle Configuration  $\wedge$  Location.*

Finally we need a number assertions to identify the facts relevant to the various factors:

- **Facts for Factor Assertion:** The following facts are relevant to determining whether a factor is present. *Wheels and Means of Propulsion are relevant to determining Vehicle Configuration.*
- **Fact linkage Assertion:** The facts relevant to the issue should be considered collectively as follows. *The presence of Vehicle Configuration is determined by considering  $(Wheels \wedge Engine) \vee (Boat \wedge (Engine \vee Oars \vee Sail))$ .*

Note that we do not need to consider the evidence level: the facts to be used have already been determined by the lower court.

We can now consider the critical questions that can be posed against these assertions. The structure as a whole is meant to provide a *test*. The questions relate to the *test too broad* and *test too narrow* arguments of [3], but our more articulated scheme offers a finer granularity since it identifies various different aspects with respect to which in which the test may be deficient. In the following CQs, by *relevant* we mean *relevant to deciding the case*.

- CQ1:** Are all the issues relevant?
- CQ2:** Are there other issues which are relevant?
- CQ3:** Are the issues linked correctly?
- CQ4:** Are all the factors really relevant to this issue?
- CQ5:** Is there an additional factor relevant to this issue?
- CQ6:** Is the relationship between factors correct?
- CQ7:** Are all the facts relevant to determining the presence of this factor?
- CQ8:** Is there an additional fact relevant to the presence of this factor?
- CQ9:** Is the relationship between facts correct?
- CQ10:** Can these facts be observed by the appropriate person?

These CQs permit a test to be challenged as too broad or too narrow at all three levels, and in two ways. As well as challenging the breadth and narrowness in terms of the elements used (e.g. CQ1 and CQ2), the breadth and narrowness can also be challenged in terms of the way the elements are combined, as in CQ3. It should also be noted that it is quite common to combine questions: for example CQ1 and CQ2 can be combined, effectively suggesting the substitution of one element for another. These could be expressed as additional CQs, but here we will rely on combinations of CQs. Note also that CQ10 relates to whether the tests can be applied by the person responsible for applying them in the operational situation: a test that cannot be applied in the actual situation is not acceptable, because ensuring that the test will be applicable in future cases is essential.

In [2] the response to such questions is said to be one of:

**Save the test:** Effectively deny that the question is pertinent to the test; for example if CQ8 is posed suggesting that an additional fact would change the position with respect to some factor, it can be maintained that the same position continues to hold.

**Modify the test:** Exclude an item (e.g. CQ1), add an item (e.g. CQ2) or change the linkage (e.g. CQ3);

**Abandon the test:** This means withdrawing the current proposal and preferring a new one.

In the course of the hearing the various elements of the proposed tests emerge. The dialogue is often not well structured: the questions are not posed in any particular order, and may be interleaved with the presentation of the proposal, so that the proposal is modified as it is presented. None the less, the aim of each counsel is to present and defend the elements required for a test which will decide the case for their client, and the justices aim to get a clear statement of the various elements between which they can use to build the arguments in their opinions.

### 3 Illustrations with *California v Carney*

Using the set of moves proposed above, we have analysed the oral hearings of *California v. Carney*. There is insufficient space to report the full analysis

here, but we provide example extracts from each of three component dialogues, showing the moves proposed and some critical questions posed against them.

### 3.1 Dialogue One - Petitioner Oral Hearing

The petitioner maintains throughout the dialogue the position that exigency is the only issue here, and that the relevant abstract factor of *inherent mobility*, that is, the capability of quickly becoming mobile, using the configuration of the vehicle as the base factor, ensures a sufficient exigency for the automobile exception to override the privacy protection of the fourth amendment. He proposes that this can be determined using easily observed facts such as *the vehicle has wheels* and the *vehicle is self-propelled*. One justice poses CQ7, suggesting that wheels might be enough, so that trailers are also covered, but the counsel rejects this suggestion and maintains his test. The question of boats is also raised (CQ8) suggesting that there must be some other consideration to cover boats. In this case the test is modified to disjoin *boat with oars* to provide an additional sufficient condition (CQ9).

Figure 1 illustrates the elements which make up the petitioner's test. An important feature of the argument is that the issues of privacy and exigency are kept separate. A justice challenges this, using CQ3, based on the Solicitor General's brief, which suggests that both must be considered.

**Unidentified Justice:** You prefer a single rationale for the exception to the warrant requirement. Namely, you think "mobility" is practically the sole criteria; and the Solicitor General at least thinks that there are two.

**Petitioner:** Well, I think there is more than one, and I think they're independent of one another,

The Solicitor General argued that there are some circumstances where a mobile home results in expectation of privacy (privacy issue) that must be considered in addition to exigency (CQ3). One example of these circumstances is when the motor home is stationary in a mobile home park for a significant period of time (CQ5). The petitioner rejects the use of the length of time parked as this cannot be determined by the law enforcement officer (CQ10). The notion of location is, however, accepted as a factor additional to vehicle configuration relating to exigency (modifying the test in response to CQ5), claiming that while a vehicle in a residential location (such as a mobile home park) *might* not be considered inherently mobile, whereupon issues of privacy would become relevant, a vehicle in a regular parking lot can always be considered inherently mobile.

**Unidentified Justice:** Well, anyway, you certainly would differ with the Solicitor General as to the application of the exception in a park, in a mobile home park?

**Petitioner:** Under the circumstances that's been presented, yes, I would.

**Unidentified Justice:** Of course that isn't the issue here, is it? This is

in a public parking lot.

**Petitioner:** That's correct, Your Honor. That is not presented in this case.

And if I might address the Solicitor General's position and explain why ours is a little bit different: The reason for our difference with the Solicitor General is because that a law enforcement officer in the field has to determine whether or not this vehicle is now placed in a constitutionally protected parking spot: if an individual is going to come upon this vehicle he's not going to know whether it's been parked in this particular motor home lot for a period of three months, or two weeks, or how long.

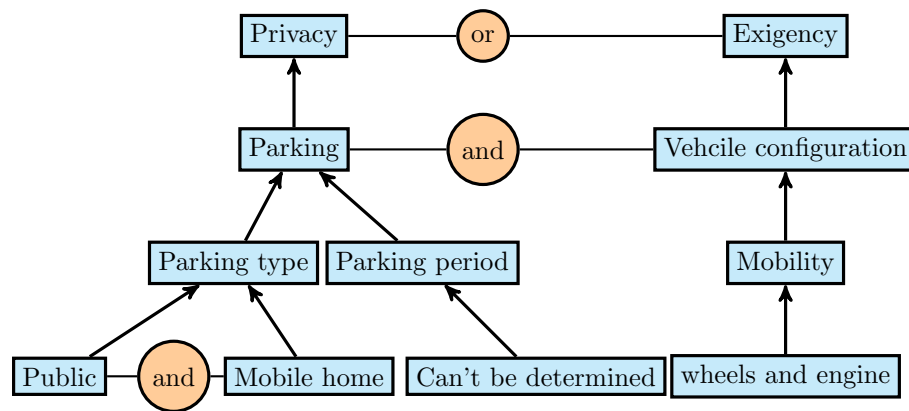


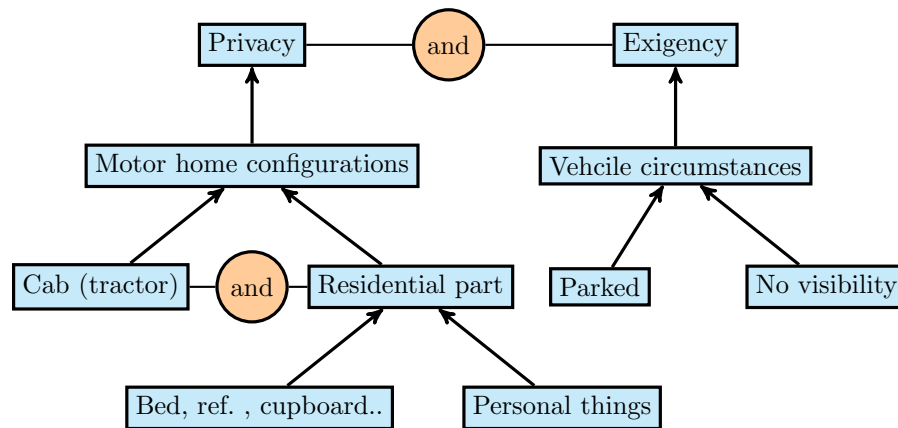
Figure 1: Elements used in Petitioner's Test

### 3.2 Dialogue Two - Respondent Oral Hearing

The respondent presents a rather different test. He insists that both *exigency* and *privacy* need to be considered. He aims to establish sufficient expectations of privacy on the grounds that the motor home is designed to be used for residential purposes as well as transportation unlike a regular passenger automobile (*However, transportation is not its sole function*) and this can be determined by the presence of facts about configuration such as: *cab and the living quarters are part of a single unit*. Also to be considered are whether there are attributes associated with a home, established using facts such as *containing a bed and a refrigerator* and whether it is used to store and transport personal items<sup>1</sup>. Additionally he aims to show that the exigency is lessened since the vehicle is not ready to be moved (*is inoperable*), because there is no driver present, and there are curtains drawn over the windscreen. Moreover because it was parked in downtown San Diego a warrant could easily have been obtained. The respondent's test is shown

<sup>1</sup> This is intended to align it with precedent cases involving luggage being transported in a car where the automobile exception did not apply.

as Figure 2. Viewed as rebuttal of the petitioner’s argument, this adds privacy as an issue (CQ2), and conjoins rather than disjoins the two issues (CQ3). *Readiness to move* and *possibility of obtaining a warrant* are introduced as additional factors for assessing exigency (CQ5). The additional factors *capable of use as a home* and *used to store and transport personal items* are proposed as additional factors relating to privacy (CQ5). The relationship between these factors was not discussed, although CQ6 was available to clarify it had any justice wished to do so.



**Figure 2: Elements used in Respondent’s Test**

The extract below is an attempt by a justice to suggest that the fact that the cab and the residential part are a single unit is not essential (CQ7) for the required vehicle configuration factor to be present. The respondent saves his test by pointing out that if we have a trailer and tractor configuration, the greater expectations of privacy apply only to the trailer, and the exigency applies only to the tractor. Under pressure, however, the respondent eventually modifies the test by introducing the *personal effects* factor (CQ5).

**Unidentified Justice:** Assume now that the automobile vehicle is the tractor that would pull the otherwise immobile motor home, or whatever you want to call it. Now you could search the tractor, but not the—

**Respondent:** I think that’s true. And the reason is—

**Unidentified Justice:** —The tractor can take off down the street and go 70 miles an hour on the highway?

**Respondent:** —The reason is, the tractor has a privacy interest which society is less prepared to recognize. It’s a diminished privacy expectation, as opposed to the motor home or the trailer itself.

**Unidentified Justice:** Well, they’re equally... when they’re attached, they’re equally moveable, aren’t they?

**Respondent:** Exactly. But one is used for private living residential purposes, and the other is used for transportation. As a matter of fact—

**Unidentified Justice:** The other one isn’t used for transportation in the



abstract, but only in connection with what it pulls. Isn't that so?

**Respondent:** –Yes, that's correct.

**Unidentified Justice:**People don't go out on the highway on the tractor alone, do they?

**Respondent:** Ordinarily not. The tractor partakes more of the automobile, because it doesn't have... it is not the kind of repository for personal effects.

### 3.3 Dialogue Three - Petitioner Rebuttal

In the last of the three nested dialogues, the petitioner attempts to rebut the tests introduced by the respondent by adding new facts and/or factors or showing the inapplicability of the tests to prove sufficient privacy.

According to the respondent test above, that the living quarter is an integral part a vehicle should attract sufficient privacy expectations. However, in the following extract the petitioner claims that it is not possible to determine these residential facts (CQ10), and in this particular case there was no evidence of food or personal items inside the motor home. So even if the personal effects factor were relevant, that is (CQ5) succeeds, it does not apply to *Carney*.

But the record does not at all support this particular assertion.

And in particular, if one examines the photographs that are a part of the record in this case that were submitted to this Court, looking at the picture of the refrigerator will show that there is marijuana in the refrigerator, but there is no food.

And when they examined the cupboards in this case, there's no underwear, there's no sheets, there's marijuana.

There's nothing in the record to suggest Mr. Carney was using this as his home, and in fact that is the problem.

There is no way to determine, in these particular class of vehicles, when they are and are not being utilized as a home, objectively.

## 4 Concluding Remarks

In this paper we have considered an important class of legal dialogues relating to reasoning about cases, namely the Supreme Court Oral hearings.

We have:

- Located these dialogues in the overall Supreme Court process;
- Identified that the dialogue consists of three distinct sub-dialogues;
- Characterised the three sub-dialogues in terms of their initial state, and individual and collective goals;

- Presented a set of moves designed to enable the goals of the dialogues to be achieved in the form of assertions and associated critical questions;
- Illustrated all points throughout using extracts from the transcript of a case much discussed in the AI and Law literature.

In future work we will present our full analysis of the transcript of *Carney*; and apply the analysis to other related cases (e.g. those discussed in [5]). We will then specify a tool which will support the analysis of Oral hearings by automatically constructing the corresponding tree from a transcript annotated with our moves. We will next relate the argument components that emerge from the Oral hearing to the arguments that are expressed in the opinions of the Justices. We conjecture that the move from oral hearing to opinion will involve selection between the options and justification of the choices made. This last may be of relevance for work on argumentation schemes since it provides a reasoned acceptance or rejection of critical questions, a topic which is as yet relatively unexplored in computational argument.

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