Arguing with Legal Cases: what do we know?

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Landmarks – Part I

- ***Taxman***: Thorne McCarty
  - Theory Construction, Prototypes and Deformations
    - *Eisner v Macomber* (Tax Law Case)
- ***HYPO***: Edwina Rissland and Kevin Ashley
  - Three Ply Argument, Dimensions
    - US Trade Secret Law

Landmarks – Part 2

- ***CABARET***: Edwina Rissland and David Skalak
  - Top Level of Rules, Argument Moves
    - Home Office Deduction
- ***CATO***: Kevin Ashley and Vincent Aleven
  - Factors, Abstract Factors, Down-Playing
    - US Trade Secret Law
- ICAIL 1993: Don Berman and Carole Hafner
  - Purpose, Teleological Reasoning
    - Pierson v Post, Keeble v Hickersgill, Young v Hitchens
      - *The Wild Animals Cases*

Landmarks – Part 3

- ***Rule Based Representation of Precedent:*** Henry Prakken and Giovanni Sartor
  - **Precedents represented as three rules:** plaintiff rule, defendant rule and priority between them
    - **Residence example (Fictional)**
- ***Value Based Theories*****:** Trevor Bench-Capon and Giovanni Sartor and Henry Prakken
  - **Rule Preferences explained as value preferences, Theory Constructors**
    - **Wild Animals Cases**

Landmarks – Part 4

- ***IBP***: Stefanie Bruninghaus and Kevin Ashley
  - Top Level of Issues: Prediction
    - US Trade Secrets Law
- ***Argumentation Schemes***: Adam Wyner, Katie Atkinson, Trevor Bench-Capon, Henry Prakken
  - Reasoning with Cases as Practical Reasoning
  - Reconstruction of CATO using Argumentation Schemes
    - Wild Animals *+ Popov v Hayashi*

Some Other Approaches – Part 1

- ***GREBE***: Karl Branting
  - Semantic Networks
    - Industrial Injury
- ***Neural Networks***:
  - Daniele Bourcier
  - Trevor Bench-Capon
    - Hospital Visit Benefit (fictional)

Some Other Approaches – Part 2

- ***BANKXX:*** Edwina Rissland, David Skalak and M. Timur Friedman
  - Assembling Arguments through Heuristic Search
    - US Bankruptcy Law
- ***AGATHA***: Alison Chorley and Trevor Bench-Capon
  - Constructing Theories as an Adversarial Game
    - Wild Animals, US Trade Secrets

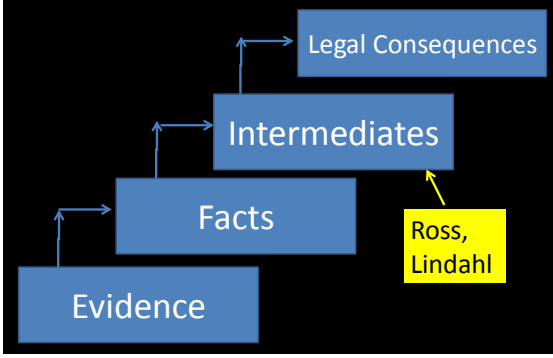
Some Other Approaches – Part 3

- ***Tangled Hierarchies:*** Bram Roth and Bart Verheij
  - Attacks on connections as well as factors
    - Dutch Employment Law
- ***Evidence***: Floris Bex, Peter van Koppen, Susan van den Braak, Henry Prakken and BartVerheij
  - Resolving conflicting witness testimony
    - Criminal cases

The Problem

- Given a set of decided cases, and a new (current) case: ***how we construct and compare arguments about how the new case?***
- **Some Issues:**
  - ***Where do we start?***: facts (higher courts) or evidence (lower courts)?
  - ***How do we represent cases?*** Facts, Dimensions, Factors, Issues, Purposes, Values.
  - ***How do we compare cases?***
  - ***How do we go beyond a fortiori reasoning?***

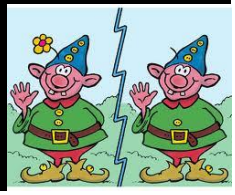
From Evidence to Decision



What makes cases similar?

- ***Not*** closeness of fact
  - Woman of 60
  - Woman of 59
    - Not similar
  - Woman of 60
  - Man of 65
    - Similar
  - Woman of 62
  - Man of 62
    - Not Similar
  - Woman of 98
  - Man of 67
    - Similar

So cannot use standard techniques like least squares



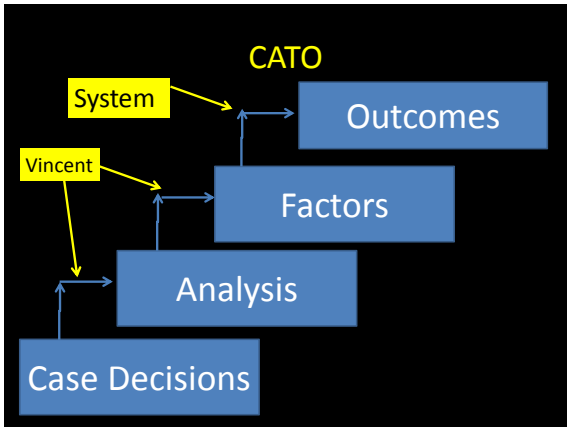
Why is a raven like a writing desk?

- That is from Lewis Carrol's Alice in Wonderland, but there are real cases in which match:
  - A fox
  - A shoal of fish
  - A baseball
- ***All being pursued***
  - A lemonade bottle
  - A coffee urn
  - A car with a loose wheel
- All imminently dangerous

Facts are unique to their cases

We need abstractions which are ***legally relevant***

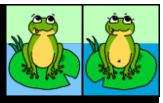
Factors provide such abstractions



Factors

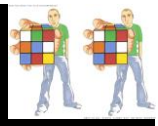
- Legally relevant features of cases: abstract from many, disparate, fact patterns
  - Emerge from case law
    - Judges relate to previous decisions through similar language: these are the factors
  - Favour one side or the other
    - Unlike dimensions
  - Are determined by analysis
    - Attempts to automate largely unsuccessful (e.g. SMILE, Bruninghaus and Ashley)

Factor Based Reasoning



- Cases are represented as sets of factors
- One step of inference:
  - Antecedent is a conjunction of factors
  - Consequent is an outcome
- Exact matches are rare: precedents are ***distinguished*** when
  - a precedent is cited for the one side
  - the precedent is stronger for that side
  - the current case is weaker for that side

Factors May Result In



- An *a fortio*ri argument for one side
  - Precedent which cannot be distinguished: all opposing precedents can be distinguished
    - (a,b,c: ?): (a,b: plaintiff) : (a,b,d: defendant)
- Arguments for both sides
  - No *a fortiori* precedent for either side
  - Distinguishable precedents for one or both sides

How do we extend our theory to choose between competing arguments?

Beyond *A Fortiori*

- CATO – Abstract Factor Hierarchy
  - Factors are children of more abstract factors
  - Factors may be reasons ***for or against*** the presence of their parent
    - ***NOT an IS-A hierachy***
  - Children factors may ***substitute*** for or ***cancel*** one another (*downplaying*)

Value Based Theory Construction

- Factors are associated with social ***values*** (purposes)
  - Deciding for the part favoured by the factor would promote the value
  - Precedents express preferences between values
  - These value preferences form a theory which explains the past decisions (more or less well)
    - We choose the best theory
  - The theory is applied to the current case
  - Can also be ***independent*** arguments for value preferences

Horty and Bench-Capon (2012)

- In Prakken and Sartor (1998) both the plaintiff and the defendant rules were as strong as possible (used ***all*** the factors)
- In Horty and Bench-Capon (2012) the rule for the winning side may be weaker (use only a subset of the factors)
  - This means that it can apply to more cases
  - But can only be justified by success

Organising Factors

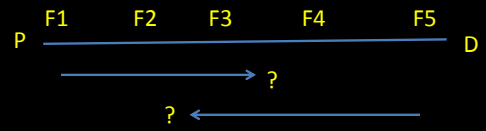
- Often cases are seen as sets of factors. But often too there is some organisation into topics or issues.
  - **CABARET**: Top level logical expression representing the statute rule
    - **Factors interpret the terms of the statute**
  - **IBP**: Top level logical "model" (from Restatement of Torts)
    - **Factors are partitioned into issues to resolve the terms of the model**
  - **Theory Construction:** Factors relate to values
    - **Factors determine which values can be promoted: preferences decide which values will be promoted**

Organising Arguments

- Three Ply Argument (HYPO, CATO)
  - Citation
  - Distinguishing and Counter Examples
  - Rebuttal: Distinguishing Counter Examples etc.
- Dialectic Tree (e.g. Prakken and Sartor)
  - Argument for
  - Argument against
  - And so on
- Cascade of Argumentation Schemes (e.g. Wyner et al)
  - Top Level Scheme
  - Schemes to establish premises of higher schemes
  - Schemes to undercut higher schemes

What About Dimensions?

- Factors as Points on Dimensions:



Where does the cross over point come?

Where do factors come from? Which side do they favour?

Other Roles for Dimensions?

- Perhaps Dimensions connect to
  - Abstract Factors?
  - Issues?
  - Values?
  - Elements in Tests?

How do Factors Combine?

- Using Logical Connectives?
  - Top Level provides Necessary and Sufficient Conditions
  - Top Level Provides Argument – some elements may be missing
- "Considerations "
  - The factors need to be ***weighed*** against one another and a judgement made

Similar considerations apply to Values

And how do we compare sets of Values?

Summary

- We understand reasoning from factors to outcomes reasonably well
  - Why we need factors
  - The logic of precedent
  - Where factors fit in the overall process
- We have some understanding of what we need to investigate
- We have some ideas about how to go about these investigations
- We have no clarity or consensus on these areas