Predicting judicial decisions of the European Court of Human Rights: a Natural Language Processing perspective

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Motivation

- Legal realism in the US and its aftermath

- Lawlor (1963): “What computers can do: analysis and prediction of judicial decisions”.

- Can computers analyse and predict judicial decisions?

Artificial Intelligence

- **Machine learning** is the subfield of computer science that 'gives computers the ability to learn without being explicitly programmed' (Samuel, 1959)

- **Natural language processing** is the subfield of computer science concerned with the interactions between computers and human (natural) languages

Previous Work

- Statistical models focused mainly on the US Supreme Court (political science)

- Analysis and prediction of judges' votes given **non textual information** (Kort, 1957; Nagel, 1963; Keown, 1980; Segal, 1984; Popple, 1996; Lauderdale & Clark, 2012)

Previous Work

- Manually crafted **“features”**, e.g.:
  - the nature/ gravity of the crime (criminal law cases)
  - the preferred policy position of each judge (‘attitudinal model’, constitutional law cases)
- Can we just use **text information** from the cases?

European Court of Human Rights (ECHtR)

- Major international court set up in 1959 by ECHR
- The ECHR is an international treaty for the protection of civil and political liberties in European democracies committed to the rule of law;
- Has jurisdiction to rule on the applications of individuals or sovereign states alleging violations of the civil and political rights set out in the Convention;
- Convention covers 47 states with 800 million population;
- Since 1998, the Court sits as a full-time court.

ECHtR

Statistics: Year 2014

- Judged on their merits: **891**
- Declared inadmissible or struck out by
  - Chambers: 900
  - Committees: 4,100
  - Single Judges: 78,700
- **Pending: 69,900**

ECHtR

- Publicly available **textual** data:
  - http:/ / hudoc.echr.coe.int
- Well-structured case format

Task Description

- **Predict** whether a particular Article of the ECHR has been violated, given **textual evidence extracted from a case**.
- Input: Text of a case
- Output:
  - -1: No-violation
  - +1: Violation

Hypotheses

- Important factors that are related to the outcome reached by the Court:
  - (1) The textual content and
  - (2) the different parts of a case.

Data set

- **Article 3:** Prohibits torture and inhuman and degrading treatment (250 cases)
- **Article 6:** Protects the right to a fair trial (80 cases)
- **Article 8:** Provides a right to respect for ones private and family life, his home and his correspondence (254 cases)
- Articles split in two equal classes: violation/ non-violation
- **Caveat:** these are only transcripts summarising the case

Case Structure

1. Procedure

2. The Facts

   2.1 Circumstances of the case

   2.2 Relevant law

3. The Law

4. Operative Provisions

Case Structure: Procedure

Case of "Velcheva v. Bulgaria"

PROCEDURE

1. The case originated in an application (no. 35355/08) against the Republic of Bulgaria lodged with the Court under Article 34 of the Convention for the Protection of Human Rights and Fundamental Freedoms ("the Convention") by a Bulgarian national, Ms Gana Petkova Velcheva ("the applicant"), on 30 June 2008.

2. The applicant was represented by Mr M. Ekimdzhiev and Ms G. Chernicherska, lawyers practising in Plovdiv. The Bulgarian Government ("the Government") were represented by their Agent, Ms Y. Stoyanova, of the Ministry of Justice.

3. The applicant alleged that the authorities had failed to comply with a final court judgment allowing her claim for restitution of agricultural land.

4. On 7 May 2013 the application was communicated to the Government.

- Procedure followed before the Court

Case Structure: The Facts

THE FACTS

I. THE CIRCUMSTANCES OF THE CASE

5. The applicant was born in 1927 and lives in the village of Ribaritsa.

6. Her father, of whom she is the sole heir, owned agricultural land in the area surround the village which was incorporated into an agricultural cooperative at the beginning of 1950s.

7. In 1991, following the adoption of the Agricultural Land Act ("the ALA", see paragraph below), the applicant applied for the land's restitution.

8. By a decision dated 10 March 1999 the land commission dealing with the case refus to restore her rights to two plots of 900 and 2,000 square metres respectively, noting t sheep pens had been built on them by the agricultural cooperative. It held that the applic was entitled to compensation in lieu of restitution.

- All material that is not considered as legal arguments
- **Circumstances of the Case:** Factual background and procedure before domestic courts
- **Relevant Law:** Legal provisions relevant to the case, outside of the articles of the Convention

Case Structure: The Law

A. Arguments of the parties

1. The Government

22. Referring to the Agriculture and Forestry Department's decision of 18 October 2006 (see paragraph 16 above) – of which the Court was not aware prior to communication of the present application – the Government argued that the applicant, in concealing its existence, had abused her right of individual application. On these grounds, the Government urged the Court to declare the application inadmissible.

23. On the merits, the Government argued that there had been no breach of the applicant's rights, because the judgment of 8 September 2005 had been enforced with the adoption of the decision of 18 October 2006. They contended that after this decision, and since the land claimed by the applicant had been transferred to a third party in 1995, it was up to the applicant to bring proceedings against that third party to defend her property rights.

- Merits of the case, through the use of legal argument

Case Structure: Operative Provisions

FOR THESE REASONS, THE COURT, UNANIMOUSLY,

1. *Declares* the application admissible;

2. *Holds* that there has been a violation of Article 6 § 1 of the Convention;

3. *Holds* that there has also been a violation of Article 1 of Protocol No. 1;

4. *Holds* that the question of the application of Article 41, insofar as it concerns the applicant's claims for pecuniary and non-pecuniary damage, is not ready for decision;
accordingly,
(a) reserves the said question;
(b) invites the Government and the applicant to submit, within four months from the date on which the judgment becomes final in accordance with Article 44 § 2 of the Convention,

- The outcome of the case, which is a decision to the effect that a violation of some Convention article either did or did not take place.

Experimental Setup

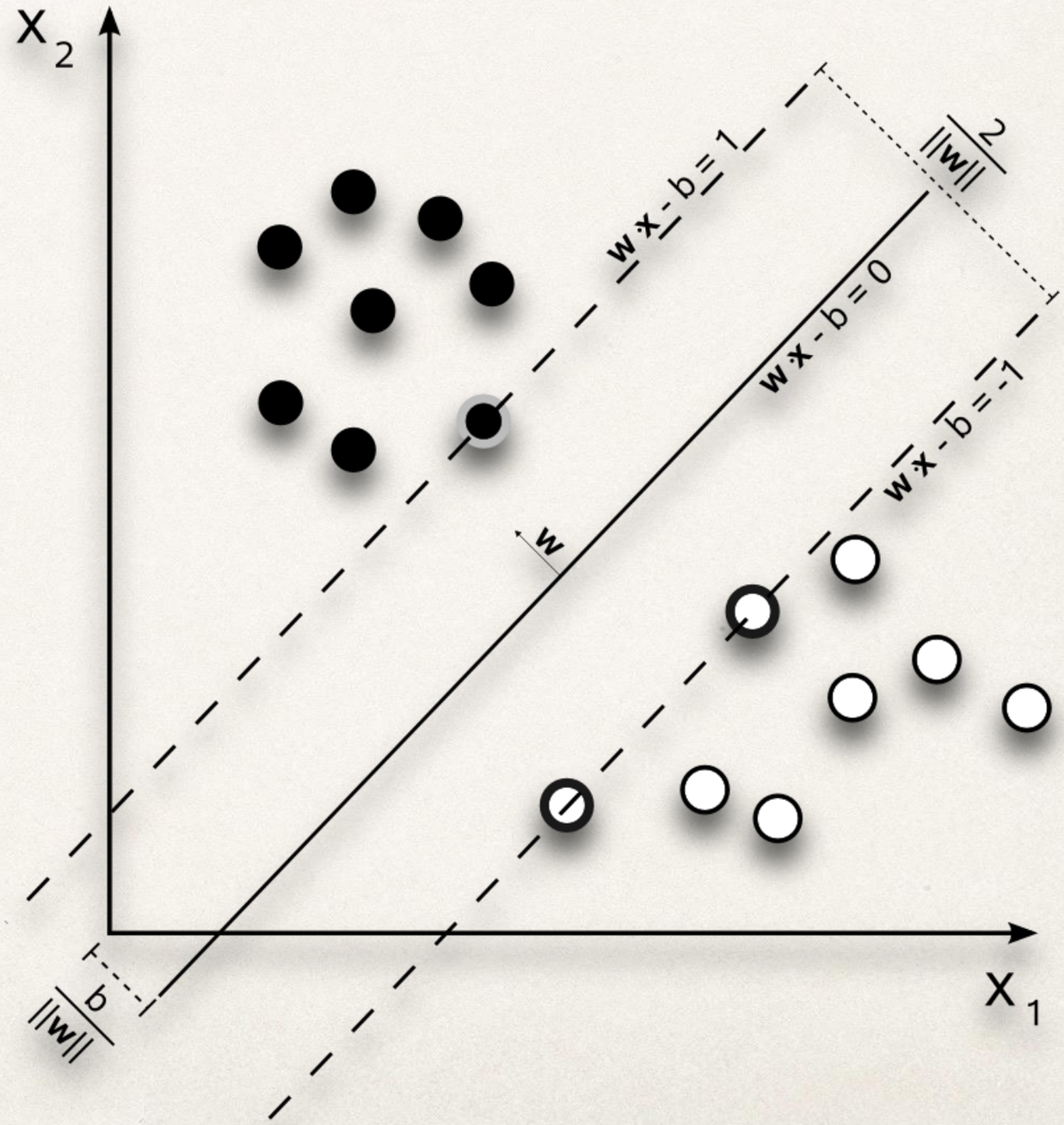
- **Features:**
  - Contiguous word sequences i.e. 1-4 grams (2000).
  - Clusters of related words, i.e. topics (30).
- Features extracted from each section of the case separately.

Experimental Setup

- **Features:**
  - Each case is represented as a vector.
  - Each element of a case vector represents a feature, e.g. an n-gram or topic.
  - Each element is weighted by the number of times the n-gram (or the words of a topic) appears in the case.

Experimental Setup

- **Classifier:**
  - Linear Support Vector Machine (SVM)



Supervised Learning - Exam Analogy

- Imagine you want to prepare for an exam in a module.
- Your **“training data”** consist of only of all the available past exam papers.
- During **training** (studying), you learn by studying past exam papers.
- You can test yourself by holding out a number of past exams (**development set**).
- **Evaluation** is performed on the exam day (**test data**)! Your score is computed by your examiner.

Experimental Setup

- Data is split into training and testing sets (90-10%)
- **Training**
  - Classifier learns from cases (vectors) and the Court's decision (-1/ +1 - no violation/ violation)
- **Testing**
  - Classifier is given case vectors and makes a prediction.

Experimental Setup

- **Evaluation:**
  - How many times the Classifier matched the Court's outcome (Accuracy)
  - 10-fold cross validation

Results

Feature Type		Article 3	Article 6	Article 8	Average
N-grams	**Full**	.70 (.10)	.82 (.11)	.72 (.05)	0.75
	Procedure	.67 (.09)	.81 (.13)	.71 (.06)	0.73
	Circumstances	.68 (.07)	.82 (.14)	.77 (.08)	0.76
	Relevant law	.68 (.13)	.78 (.08)	.72 (.11)	0.73
	Facts	.70 (.09)	.80 (.14)	.68 (.10)	0.73
	Law	.56 (.09)	.68 (.15)	.62 (.05)	0.62
Topics		**.78 (.09)**	.81 (.12)	.76 (.09)	0.78
Topics & Circumstances		.75 (.10)	**.84 (0.11)**	**.78 (0.06)**	**0.79**

Qualitative Analysis

- First issue: the determinants of judicial decision-making
- (Roughly): realism v formalism in legal theory: role of facts of the case
- Predictive priority of the ‘circumstances’ subsection as against the ‘law’ subsection
- Caveats: selection effect, formulation of the ‘circumstances’ subsection by the Court itself

Qualitative analysis (contd.)

- ‘Topics’ created by the algorithm appear to correlate with trends/ patterns in the case law of the ECtHR

- Example: long detention sentences under Article 3 ECHR

- Second example: social policy of states

- However, this is not always the case (some topics are non-informative and others have been misclassified)

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