University
of
São Paulo

Alexander von Humboldt
Stiftung/Foundation

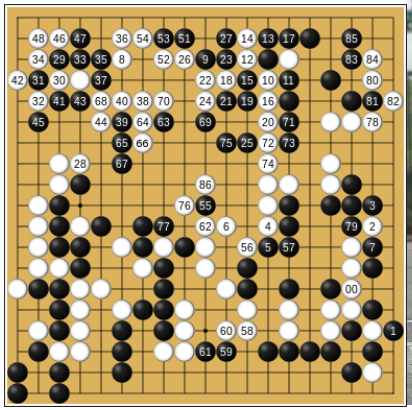
3º Ciclo de Debates INOVAESCOLA
EMSPU

Juliano Maranhão

Faculdade de Direito da Universidade de São Paulo
Diretor do Lawgorithm
C4AI-USP
Pesquisador da Fundaçãso Alexander von Humboldt

Gerações da Inteligência Artificial

Expert Systems	Data Systems
Estrutura pré-definida	Estrutura Adaptativa: modelos matemáticos com parâmetros abertos
Fundamento: raciocínio •Base de conhecimento •Inferência	Fundamento: classificação (padrões) •Funções lineares •Probabilidade •Redes neurais •Árvores de decisão • etc.
•Inteligível (Explicável)	•Escala



“Data Systems” no Direito

- **ML e NLP a partir de base de textos jurídicos (ECHR Predictor, SCOTUS, Claudette)**
    - padrões para extração de informações e classificações de conjuntos de textos (cadastro, sistematização e predições).
- **Redes de objetos jurídicos (Ravel)**
    - rede de grafos sobre objetos como leis (artigos), precedentes e conceitos jurídicos referidos de modo cruzado
- **Q&A e chatbots jurídicos (Ross, Yuki)**
    - Buscam trechos de documentos jurídicos na web que são candidatos a respostas a textos apresentados como questões ou classificam questões usando ML e NLP cuja resposta está em base de dados

Imprensa sobre IA&Direito

Lawyers could be the next profession to be replaced by computers (cnbc.com)

AI is doing legal work. But it won't replace lawyers, yet. (nytimes.com)

The robot lawyers are here – and they're winning (bbc.com)

"**Artificially Intelligent 'judge' developed which can predict court verdicts with 79% accuracy**" (…) "Computer scientists … developed an algorithm which can not only weigh up legal evidence, but also moral considerations." (Daily Telegraph 24 Oct 2016)

ECHR Predictor

Treinado sobre textos completos de decisões sobre 3 artigos da Convenção Européia de Direitos Humanos:

3 (tortura, 250), 6 (fair trial, 80), 8 (privacidade, 254)

Tarefa: ECHR decidiu que artigo X foi violado?

Resultados: Resposta correta em 79% dos casos.

Mas:

- Chute= 50%
- O sistema não prediz resultados:
  - precisa da maior parte do conteúdo da decisão para o resultado
- O sistema não consegue explicar seus resultados (NLP estatística)

N. Aletras, D. Tsarapatsanis, D. Pietro-Preotiuc & V. Lampos (2017). Predicting judicial decisions of the European Court of Human Rights: a natural language processing perspective. *PeerJ. CompSci* 2e:93, DOI 10.7717/peerj-cs.93

PeerJ Computer Science

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

Nikolaos Aletras[1,2], Dimitrios Tsarapatsanis[3], Daniel Preoţiuc-Pietro[4,5] and Vasileios Lampos[2]

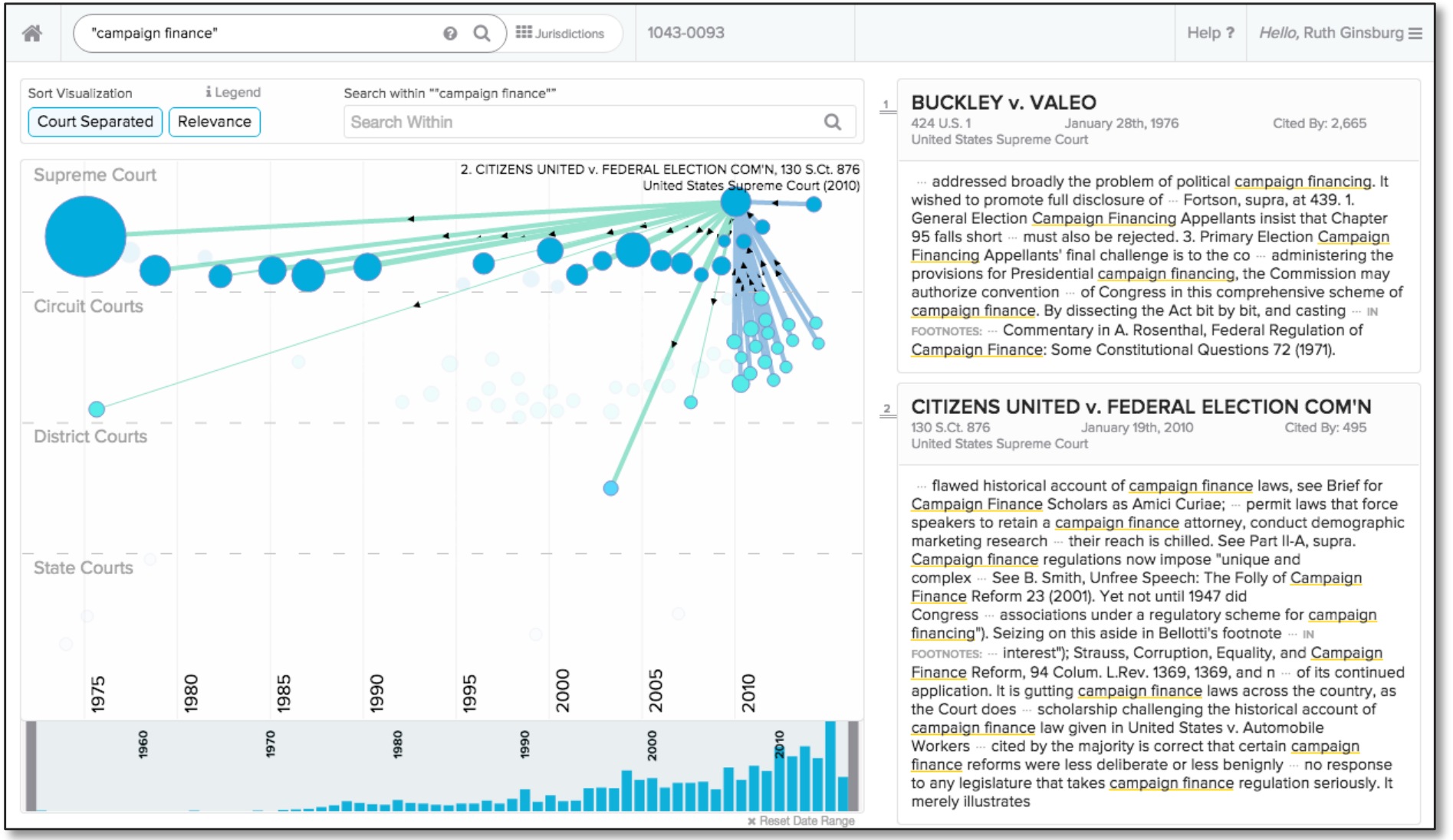
[1] Amazon.com, Cambridge, United Kingdom
[2] Department of Computer Science, University College London, University of London, London, United Kingdom
[3] School of Law, University of Sheffield, Sheffield, United Kingdom
[4] Positive Psychology Center, University of Pennsylvania, Philadelphia, United States
[5] Computer & Information Science, University of Pennsylvania, Philadelphia, United States

ABSTRACT

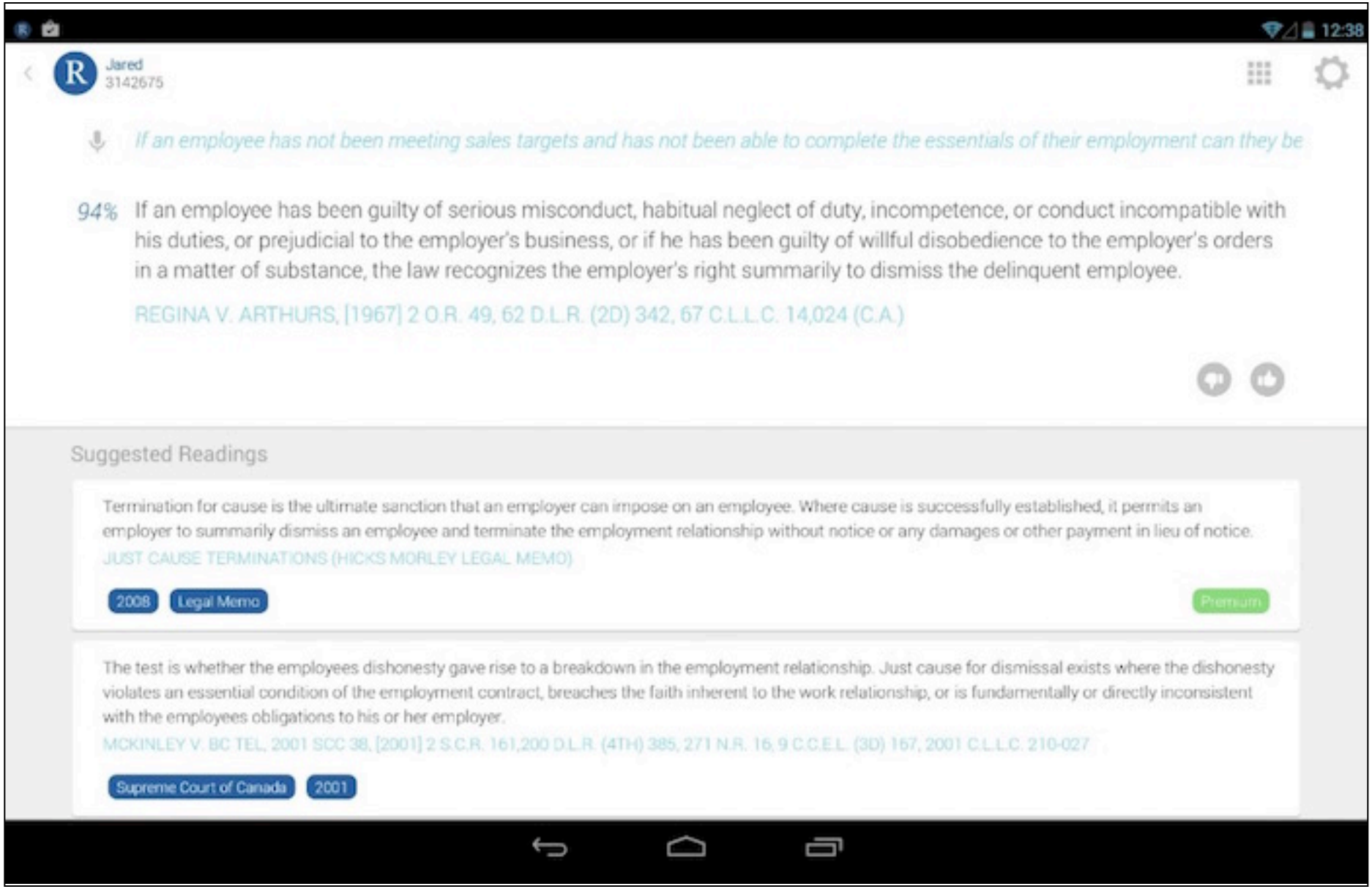
Recent advances in Natural Language Processing and Machine Learning provide us with the tools to build predictive models that can be used to unveil patterns driving judicial decisions. This can be useful, for both lawyers and judges, as an assisting tool to rapidly identify cases and extract patterns which lead to certain decisions. This paper presents the first systematic study on predicting the outcome of cases tried by the European Court of Human Rights based solely on textual content. We formulate a binary classification task where the input of our classifiers is the textual content extracted from a case and the target output is the actual judgment as to whether there has been a violation of an article of the convention of human rights. Textual information is represented using contiguous word sequences, i.e., N-grams, and topics. Our models can predict the court's decisions with a strong accuracy (79% on average). Our empirical analysis indicates that the formal facts of a case are the most important predictive factor. This is consistent with the theory of legal realism suggesting that judicial decision-making is significantly affected by the stimulus of the facts. We also observe that the topical content of a case is another important feature in this classification task and explore this relationship further by conducting a qualitative analysis.

Submitted 11 May 2016
Accepted 23 September 2016
Published 24 October 2016

Rede de Grafos: Ravel (ravellaw.com)



Ross


12:38
Jared
3142675
If an employee has not been meeting sales targets and has not been able to complete the essentials of their employment can they be
94% If an employee has been guilty of serious misconduct, habitual neglect of duty, incompetence, or conduct incompatible with his duties, or prejudicial to the employer's business, or if he has been guilty of willful disobedience to the employer's orders in a matter of substance, the law recognizes the employer's right summarily to dismiss the delinquent employee.
REGINA V. ARTHURS, [1967] 2 O.R. 49, 62 D.L.R. (2D) 342, 67 C.L.L.C. 14,024 (C.A.)
Suggested Readings
Termination for cause is the ultimate sanction that an employer can impose on an employee. Where cause is successfully established, it permits an employer to summarily dismiss an employee and terminate the employment relationship without notice or any damages or other payment in lieu of notice.
JUST CAUSE TERMINATIONS (HICKS MORLEY LEGAL MEMO)
2008
Legal Memo
Premium
The test is whether the employees dishonesty gave rise to a breakdown in the employment relationship. Just cause for dismissal exists where the dishonesty violates an essential condition of the employment contract, breaches the faith inherent to the work relationship, or is fundamentally or directly inconsistent with the employees obligations to his or her employer.
MCKINLEY V. BC TEL, 2001 SCC 38, [2001] 2 S.C.R. 161,200 D.L.R. (4TH) 385, 271 N.R. 16, 9 C.C.E.L. (3D) 167, 2001 C.L.L.C. 210-027
Supreme Court of Canada
2001

SQuAD2.0

The Stanford Question Answering Dataset

What is SQuAD?

Stanford **Qu**estion **A**nswering **D**ataset (SQuAD) is a reading comprehension dataset, consisting of questions posed by crowdworkers on a set of Wikipedia articles, where the answer to every question is a segment of text, or *span*, from the corresponding reading passage, or the question might be unanswerable.

SQuAD2.0 combines the 100,000 questions in SQuAD1.1 with over 50,000 unanswerable questions written adversarially by crowdworkers to look similar to answerable ones. To do well on SQuAD2.0, systems must not only answer questions when possible, but also determine when no answer is supported by the paragraph

Leaderboard

SQuAD2.0 tests the ability of a system to not only answer reading comprehension questions, but also abstain when presented with a question that cannot be answered based on the provided paragraph.

Rank	Model	EM	F1
	Human Performance *Stanford University* (Rajpurkar & Jia et al. '18)	86.831	89.452
1 Apr 06, 2020	SA-Net on Albert (ensemble) *QIANXIN*	**90.724**	**93.011**
2 May 05, 2020	SA-Net-V2 (ensemble) *QIANXIN*	90.679	92.948

Entendimento do texto (SQUAD)

Maria foi brincar no parque. Ela viu um cachorro perto de uma árvore. Brincou com um gato e depois foi para casa.

Onde foi Maria?
R: Parque
O que Maria viu?
R: Cachorro e Árvore

Maria viu um gato?
R:?
Maria ficou com medo do gato?
R: ?

Predição de Divergência: Explicação?

Diego M. Radzinschi (ALM)

The Genealogy of Ideology: Predicting Agreement and Persuasive Memes in the U.S. Courts of Appeals

Shivam Verma
Department of Mathematics
Courant Institute of Mathematical Sciences, New York University
New York, New York 10003
sv1239@nyu.edu

Adithya Parthasarathy
Department of Computer Science
Courant Institute of Mathematical Sciences, New York University
New York, New York 10003
ap4608@nyu.edu

Daniel L. Chen
Institute for Advanced Study, Toulouse School of Economics
21 alle de Brienne
Toulouse 31015, France
daniel.li.chen@gmail.com

ABSTRACT

We employ machine learning techniques to identify common characteristics and features from cases in the US courts of appeals that contribute in determining dissent. Show that our models were able to predict vote alignment with an average F1 score of 73%. Exploration into which factors help in arriving at this accuracy show that the length of the opinion, the number of citations in the opinion, and voting valence, are all key factors. These results indicate that certain high level characteristics of a case can be used to predict dissent. We also explore the influence of dissent using seating patterns of judges, and our results show that raw counts of how often two judges sit together plays a role in dissent. In addition to the dissents, we analyze the notion of memetic phrases occurring in opinions - phrases that see a small spark of popularity but eventually die out in usage - and try to correlate them to dissent.

CCS CONCEPTS

•**Computing methodologies** →*Machine learning*; Artificial intelligence; •**Applied computing** →**Law**;

KEYWORDS

U.S. Courts of Appeals, judges, n-grams, citation network, memes, machine learning.

ACM Reference format:
Shivam Verma, Adithya Parthasarathy, and Daniel L. Chen. 2017. The Genealogy of Ideology: Predicting Agreement and Persuasive Memes in the U.S. Courts of Appeals. In *Proceedings of ICAIL '17, London, United Kingdom, June 12-16, 2017*, 4 pages.
DOI: 10.1145/3086512.3086544

1 INTRODUCTION

Past and recent advances in machine learning techniques and natural language processing augur an increase in their use and importance in the analysis of legal literature. A number of recent studies use machine learning on Supreme Court and other law datasets to make interesting predictions, such as predicting the outcome of Supreme Court decisions [9], something which legal experts are notoriously unsuccessful at, or predicting authorship of unsigned judicial opinions [12].

Our overarching objective is two-fold - firstly, to predict the vote alignment between two Court of Appeals judges based on their historical voting record, as well as other case-based and judge-based features. Secondly, we consider how seating and citation patterns between judges affect their voting. Thus, in addition to using the voting history, we also make use of the citation and seating networks among judges.

ICAIL '17, London, United Kingdom

DOI: 10.1145/3086512.3086544

2 DATA

The original dataset contains opinions from 387,898 cases (1880-2013), collected by one of the authors, as well as features for these cases from "The United States Courts of Appeals database" [14]. For this paper, we use a manually coded (or *labelled*) sample of 5% of all cases, where additional features cover the legal areas of the case, participants, and the motions involved. This data is randomly sampled among the years and weights are assigned to each circuit year according to the proportion of the universe of cases contained in the particular circuit and year. We make use of the list of judges on a case to construct a seating graph. We also use a dataset of U.S. Courts of Appeals Judge biographies, from "The Judicial Research Initiative" [6].

3 APPROACH

We construct a number of features, belonging to the following main categories:

(1) **Judge Bio**: We use data from The Judicial Research Initiative [6] and cross reference the judge's ID with the code for the judges in the case document to merge the two together. This gives us about 269 features [8]. Features included year of commission, law degree institution, etc.
(2) **Case characteristics**: We use 228 features on case characteristics [14, 15], history of the case, nature of the case, the participants and issue coding. Features included year of decision, state of court, total number of appellants, type of the case, commonly used constitutional provisions etc.
(3) **Proceedings of the case**: We use the text from the case document to extract out the case proceedings in the form of n-grams. Commonly occurring n-grams between judges were considered as features.
(4) **N-grams, Citation and Seating patterns**: The seating and citation graphs provide data on how often two judges

Espectro de automação no judiciário

- Cadastro
- Classificação e organização da informação
- Agrupamento de casos por similaridade (julgamentos repetitivos)
- Jurimetria- direcionamento para conciliação
- Conclusões sobre evidências
- Decisões interlocutórias (despachos)
- Decisões finais

Explicação Empírica x Justificação Normativa

- Demanda por confiança (interação magistrado-máquina)
- Demanda por transparência (social)
- Demanda por devido processo legal (contraditório)

University
of
São Paulo

Alexander von Humboldt
Stiftung/Foundation

julianomaranhao@gmail.com