



# A Brief History of AI & Law: Key Milestones for Legal IR & NLP

Jack G. Conrad

TR Labs -- Applied Research

45<sup>th</sup> European Conference on Information Retrieval

**ECIR 2023**

Thursday, 6 April 2023

# Outline

## AI & Law: A Brief History of Key Research & Milestones

- Background
- Foundations of the Research Community
- Overview of Field
  - Sketch of 35+ Years of AI and Law
  - The Role of Legal Startups
- From Past to Present
  - Some Comparisons
- A Look to the Future
  - What will next generation capabilities look like?

# AI and Law – Foundations of the Research Community

# The AI and Law Journal

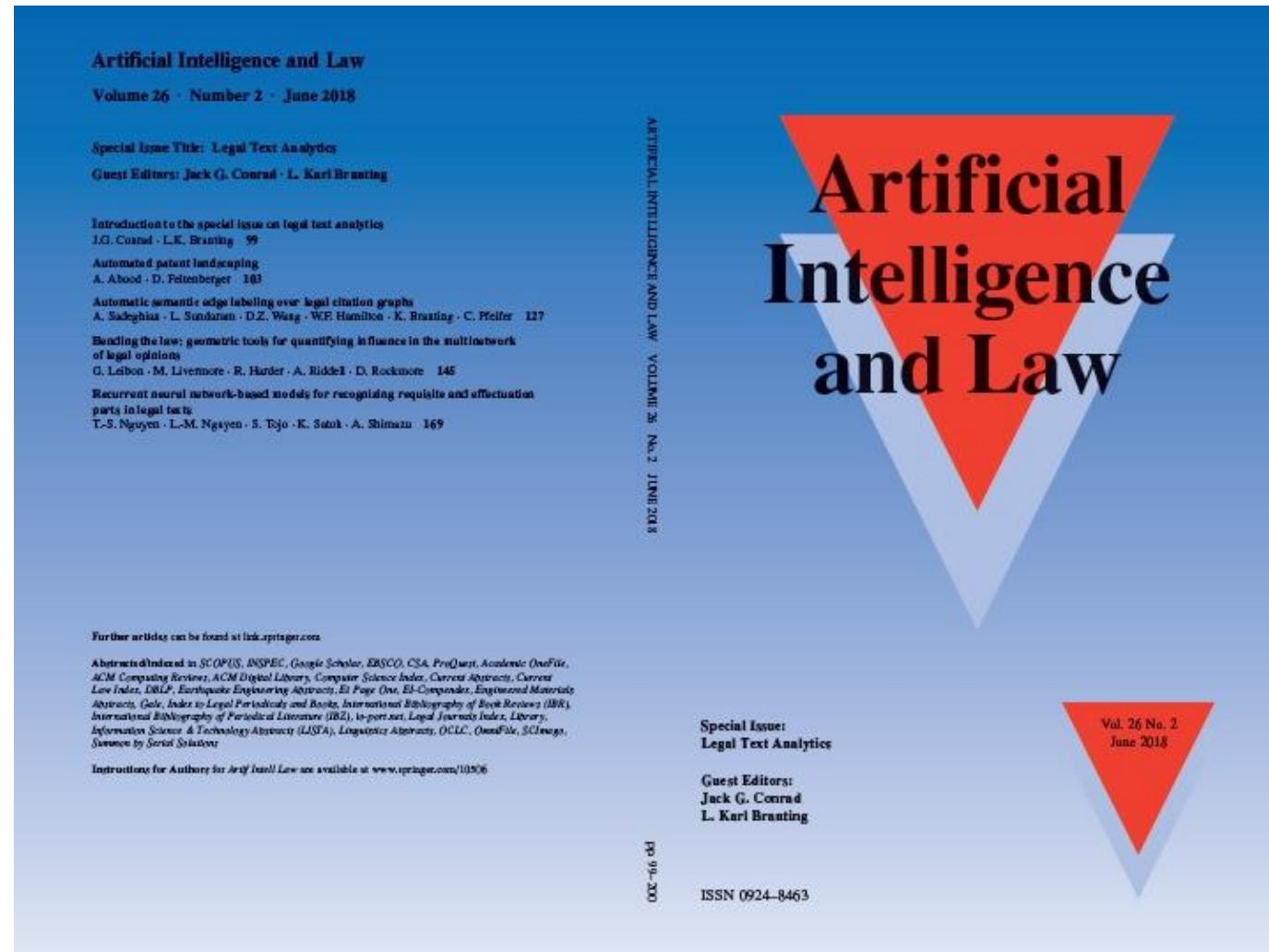
Established in 1992

## Editors

- Kevin L. Ashley
- Trevor Bench-Capon
- Giovanni Sartor

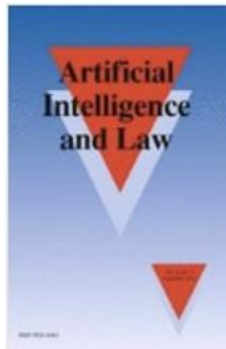
Extensive Editorial Board with specialists covering a broad range of topical research areas.

Published by Springer (NL)





Key Issue – Reviewing 30 years of research papers in the journal (divided into 3 decades)



[Open Access](#) | [Published: 09 August 2022](#)

## Thirty years of *artificial intelligence and law: the third decade*

[Serena Villata](#), [Michal Araszewicz](#), [Kevin Ashley](#), [Trevor Bench-Capon](#) , [L. Karl Branting](#), [Jack G. Conrad](#) & [Adam Wyner](#)

[Artificial Intelligence and Law](#) **30**, 561–591 (2022) | [Cite this article](#)

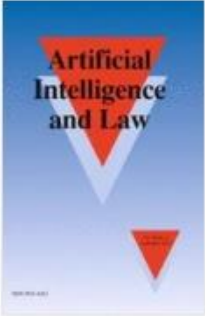
**2778** Accesses | **3** Citations | **9** Altmetric | [Metrics](#)

### Abstract

The first issue of *Artificial Intelligence and Law* journal was published in 1992. This paper offers some commentaries on papers drawn from the Journal's third decade. They indicate a major shift within Artificial Intelligence, both generally and in AI and Law: away from symbolic techniques to those based on Machine Learning approaches, especially those based on Natural Language texts rather than feature sets. Eight papers are discussed: two concern the management and use of documents available on the World Wide Web, and six apply machine learning techniques to a variety of legal applications.

# The AI and Law Journal


Key Issue – Reviewing 25 years of ICAIL research papers (3-4 papers per year)



Artificial Intelligence and Law  
September 2012, Volume 20, [Issue 3](#), pp 215–319 | [Cite as](#)

## A history of AI and Law in 50 papers: 25 years of the international conference on AI and Law

**Authors** [Authors and affiliations](#)

Trevor Bench-Capon , Michał Araszkiewicz, Kevin Ashley, Katie Atkinson, Floris Bex, Filipe Borges, Daniele Bourcier, Paul Bourguine, Jack G. Conrad, Enrico Francesconi, Thomas F. Gordon, Guido Governatori, Jochen L. Leidner, David D. Lewis, Ronald P. Loui, L. Thorne McCarty, Henry Prakken, Frank Schilder, Erich Schweighofer, Paul Thompson, Alex Tyrrell, Bart Verheij, Douglas N. Walton, Adam Z. Wyner, [show less](#)


Article  
**First Online:** 29 September 2012

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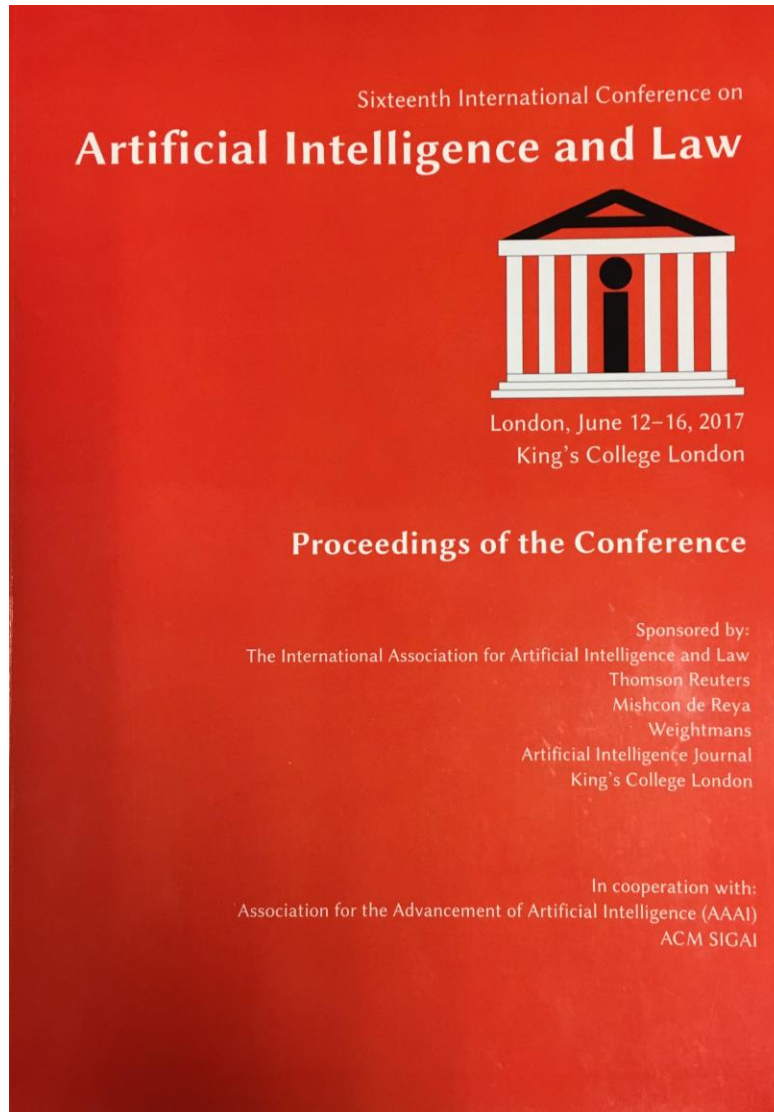
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6 J.G. Conrad – Tutorial on Legal IR and NLP (ECIR '23) – 6 April 2023

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# ICAIL: Proceedings of the Int'l Conference on AI and Law – Latest Issue 2021



- From the biennial conference
- Print + Digital versions
- Accessible from the ACM Digital Library
- Full length, short and demo papers
- Introduction from PC Chairs
- Listings of workshops
- Hosted by IAAIL.org (more anon)

# ICAIL: Proceedings of the Int'l Conference on AI and Law – 18 + counting

## ICAIL 1997

The Sixth International Conference on Artificial Intelligence and Law

**Location:** University of Melbourne Law School

**Program Chair:** L. Karl Branting, University of Wyoming

**Conference Chair:** John Zeleznikow (La Trobe University, Australia) and Dan Hunter (University of Melbourne, Australia)

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail97.html>

## ICAIL 1995

The Fifth International Conference on Artificial Intelligence and Law

**Location:** University of Maryland, College Park, MD

**Program Chair:** Trevor Bench-Capon, Department of Computer Science, University of Liverpool

**Conference Chair:** L. Thorne McCarty, Department of Computer Science, Rutgers, The State University of New Jersey

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail95.html>

## ICAIL 1993

The Fourth International Conference on Artificial Intelligence and Law

**Location:** Vrije Universiteit, Amsterdam

**Program Chair:** Kevin Ashley, School of Law, University of Pittsburgh

**Conference Chair:** Anja Oskamp, Open Universiteit, the Netherlands

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail93.html>

## ICAIL 1991

The Third International Conference on Artificial Intelligence and Law

**Location:** St Catherine's College, University of Oxford

**Program Chair:** Marek Sergot, Department of Computing, Imperial College London

**Conference Chair:** Richard Susskind, Masons, UK

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail91.html>

## ICAIL 1989

The Second International Conference on Artificial Intelligence and Law

**Location:** University of British Columbia, Vancouver

**Program Chair:** Edwina L. Rissland, Department of Computer Science, University of Massachusetts

**Conference Chairs:** J. C. Smith and Robert T. Franson (University of British Columbia)

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail89.html>

## ICAIL 1987

The First International Conference on Artificial Intelligence and Law

**Location:** Northeastern University, Boston, MA

**Program Chair:** L. Thorne McCarty, Department of Computer Science, Rutgers, The State University of New Jersey

**Conference Chair:** Carole D. Hafner, Northeastern University, Boston

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail87.html>

## ICAIL 2009

The Twelfth International Conference on Artificial Intelligence and Law

**Location:** Autonomous University of Barcelona

**Program Chair:** Carole D. Hafner, College of Computer and Information Science, Northeastern University, Boston

**Conference Chair:** Pompeu Casanovas, Institute of Law and Technology, Autonomous University of Barcelona

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2009.html>

## ICAIL 2007

The Eleventh International Conference on Artificial Intelligence and Law

**Location:** Stanford Law School, Stanford, California

**Program Chair:** Radboud Winkels, Leibniz Center for Law, University of Amsterdam, The Netherlands

**Conference Chair:** Anne Gardner, Atherton, California

**Website:** <http://www.iaail.org/past-icail-conferences/icail2007/index.html>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2007.html>

## ICAIL 2005

The Tenth International Conference on Artificial Intelligence and Law

**Location:** University of Bologna

**Program Chair:** Anne Gardner, Atherton, California

**Conference Chair:** Giovanni Sartor, University of Bologna

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2005.html>

## ICAIL 2003

The Ninth International Conference on Artificial Intelligence and Law

**Location:** University of Edinburgh

**Program Chair:** Giovanni Sartor, University of Bologna

**Conference Chairs:** John Zeleznikow (The Edinburgh Law School, University of Edinburgh) and Lillian Edwards (The Edinburgh Law School, University of Edinburgh)

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2003.html>

## ICAIL 2001

The Eighth International Conference on Artificial Intelligence and Law

**Location:** Washington University, St. Louis, MO

**Program Chair:** Henry Prakken, Department of Information and Computing Sciences, Utrecht University, The Netherlands

**Conference Chair:** Ronald P. Loui, Department of Computer Science, Washington University, Saint Louis, MO

**Website:** <http://www.iaail.org/past-icail-conferences/icail2001/index.html>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2001.html>

## ICAIL 1999

The Seventh International Conference on Artificial Intelligence and Law

**Location:** University of Oslo, Norway

**Program Chair:** Thomas F. Gordon, GMD, Germany

**Conference Chair:** Jon Bing, NRCCL (Norwegian Research Center for Computers and Law) and Andrew J. I. Jones, University of Oslo

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail1999.html>

## ICAIL 2021

The Eighteenth International Conference on Artificial Intelligence and Law

**Location:** University of São Paulo, Brazil

**Program Chair:** Adam Zachary Wyner (Swansea University, United Kingdom)

**Conference Chair:** Juliano Maranhão (University of São Paulo, Brazil)

**Website:** <https://icail.lawgorthm.com.br/>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2021.html>

## ICAIL 2019

The Seventeenth International Conference on Artificial Intelligence and Law

**Location:** Cyberjustice Laboratory, University of Montreal, Canada

**Program Chair:** Floris Bex (Utrecht University & Tilburg University)

**Conference Chair:** Karim Benyekhlef (University of Montreal)

**Website:** <http://www.iaail.org/?q=article/icail-2019-17th-international-conference...>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2019.html>

## ICAIL 2017

The Sixteenth International Conference on Artificial Intelligence and Law

**Location:** Strand Campus of King's College London

**Program Chair:** Guido Governatori, Data61, CSIRO, Australia

**Conference Chair:** Jeroen Keepens, King's College London, UK

**Website:** <https://nms.kcl.ac.uk/icail2017/>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2017.html>

## ICAIL 2015

The Fifteen International Conference on Artificial Intelligence and Law

**Location:** University of San Diego School of Law

**Program Chair:** Katie Atkinson, University of Liverpool, UK

**Conference Chair:** Ted Sichelman, University of San Diego School of Law

**Website:** <http://sites.sandiego.edu/icail/>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2015.html>

## ICAIL 2013

The Fourteen International Conference on Artificial Intelligence and Law

**Location:** National Research Council (CNR) of Italy, Rome

**Program Chair:** Bart Verheij, University of Groningen, The Netherlands

**Conference Chair:** Enrico Francesconi, ITTIG-CNR, Italy

**Website:** <http://icail2013.ittig.cnr.it>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2013.html>

## ICAIL 2011

The Thirteenth International Conference on Artificial Intelligence and Law

**Location:** University of Pittsburgh School of Law, Pittsburgh, PA

**Program Chair:** Tom van Engers, Leibniz Center for Law, University of Amsterdam, The Netherlands

**Conference Chair:** Kevin Ashley, University of Pittsburgh School of Law

**Website:** <http://www.law.pitt.edu/events/2011/06/icail-2011-the-thirteenth-interna...>

**Bibliography:** <http://www.informatik.uni-trier.de/~ley/db/conf/icail/icail2011.html>



# Does IAAIL Support Regional Conferences?

**Europe** – each November or December

Originated in the Netherlands

**Asia** – each autumn

Typically hosted in Japan



# JURIX

The Foundation for Legal Knowledge Based Systems

## JURIX 2022

35<sup>th</sup> International Conference on  
Legal Knowledge and  
Information Systems

December 14-16, 2022

The conference will be held in  
Saarbrücken, Germany

MUNI



# JURISIN

## Sixteenth International Workshop on Juris-informatics (JURISIN 2022)

### **COLIEE** – Competition on Legal Information Extraction and Entailment

- Held every year
  - With ICAIL or with JURISIN, depending on year
  - Generally ~5 tasks involving case or statute retrieval and entailment, legal question answering, etc.
  - Tasks can be using Japanese or English (translation) texts

# ICAIL: Workshops covering latest trends in AI and Law

List of Workshops from ICAIL 2019



**Tutorial – Introduction to AI & Law**

**Tutorial – Defeasible Logic for Normative Reasoning**

**Doctoral Consortium**

**2nd Workshop on AI in Legal Practice**

**1st Workshop on AI vs. Intelligent Assistance for Legal Professionals in the Digital Workplace (LegalAIIA)**

**LegRegSW 2019: A Workshop on a Legislation and Regulation Semantic Web – a shared corpus task**

**1st Workshop on Artificial Intelligence and the Administrative State**

**ASAIL 2019: Third Workshop on Automated Detection, Extraction and Analysis of Semantic Information in Legal Texts**

**Competition on Legal Information Extraction and Entailment (COLIEE 2019)**

**2nd MMAIL: Multilingual Workshop on AI & Law research**

**Tutorial – Automated Deduction with Legal Texts**

# What Organization Hosts ICAIL?

**IAAIL.org** : International Association for Artificial Intelligence and Law

**BREAKING** ICAIL 2023 - 19th International Conference on Artificial Intelligence and Law...

International Association for  
**Artificial Intelligence and Law**

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**ICAIL 2023 - 19TH INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE AND LAW - CALL FOR PAPERS, DEMONSTRATIONS, WORKSHOPS AND TUTORIALS**

Submitted by iaail on Fri, 07/29/2022 - 14:02

**June 19-23, 2023**

Hosted by:  
**Universidade do Minho, Braga, Portugal**  
Universidade do Minho Law School with JUSGOV – Research Center for Justice and Governance, Centro Algoritmi and LASI – Laboratório Associado de Sistemas Inteligentes  
Conference Website: <https://icail2023.dl.uminho.pt>

Tags: Call for Papers

**READ MORE**

**ICAIL 2023 WILL BE HELD IN BRAGA, PORTUGAL**

The next International Conference on AI and Law (ICAIL 2023) will be organized by the University of Minho, Braga, Portugal

**FEATURED VIDEOS**

ICAIL 2021 - Great Opening

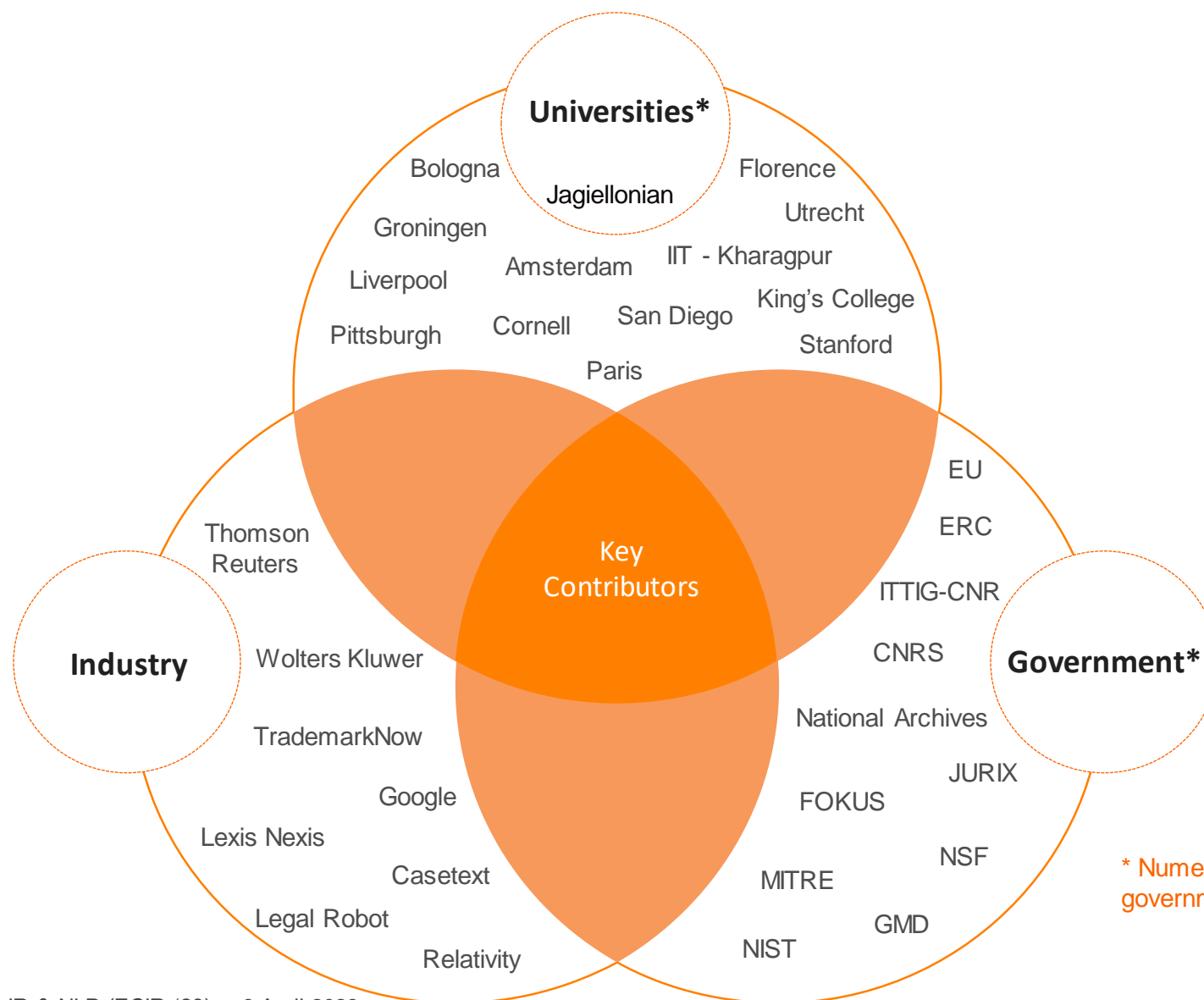
**LATEST PHOTOS**

11 J.G. Conrad THOMSON REUTERS®



# The Community and the Conference (IAAIL and ICAIL)

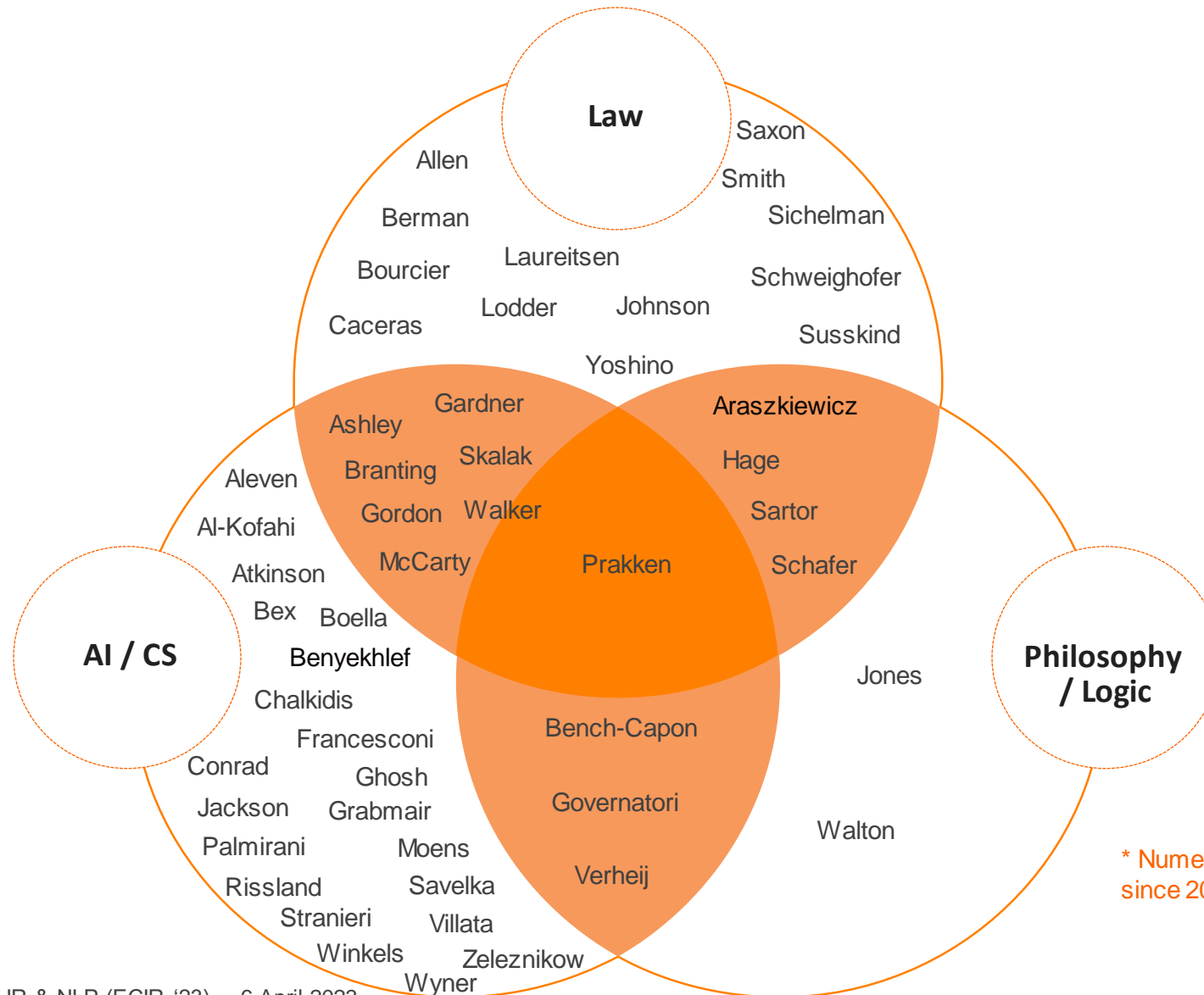
## Demographics





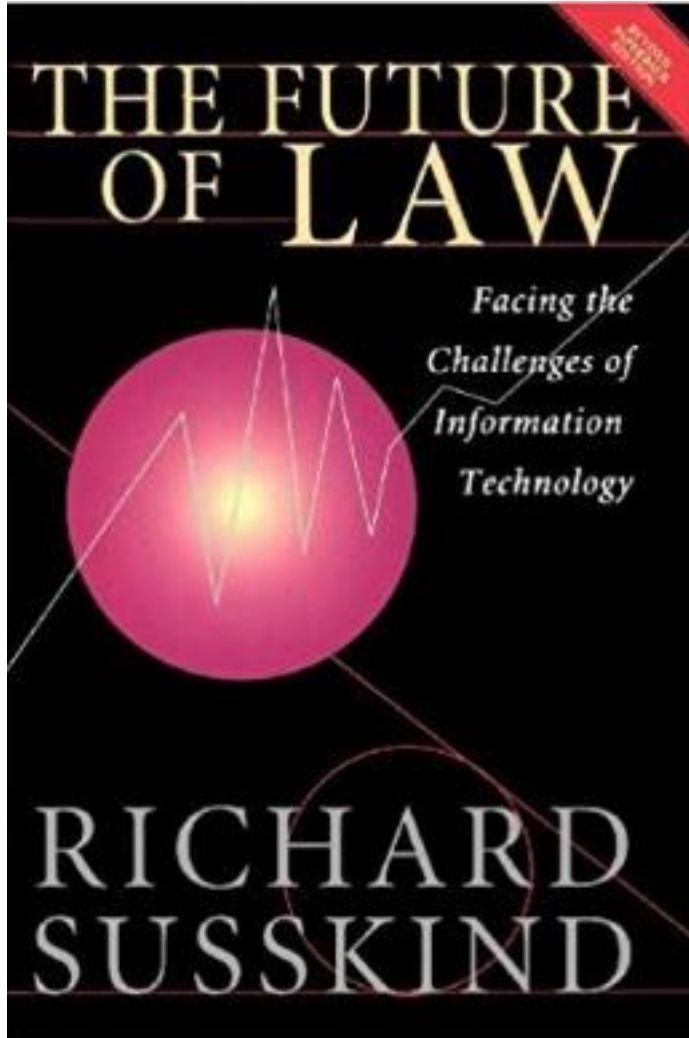
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## Demographics

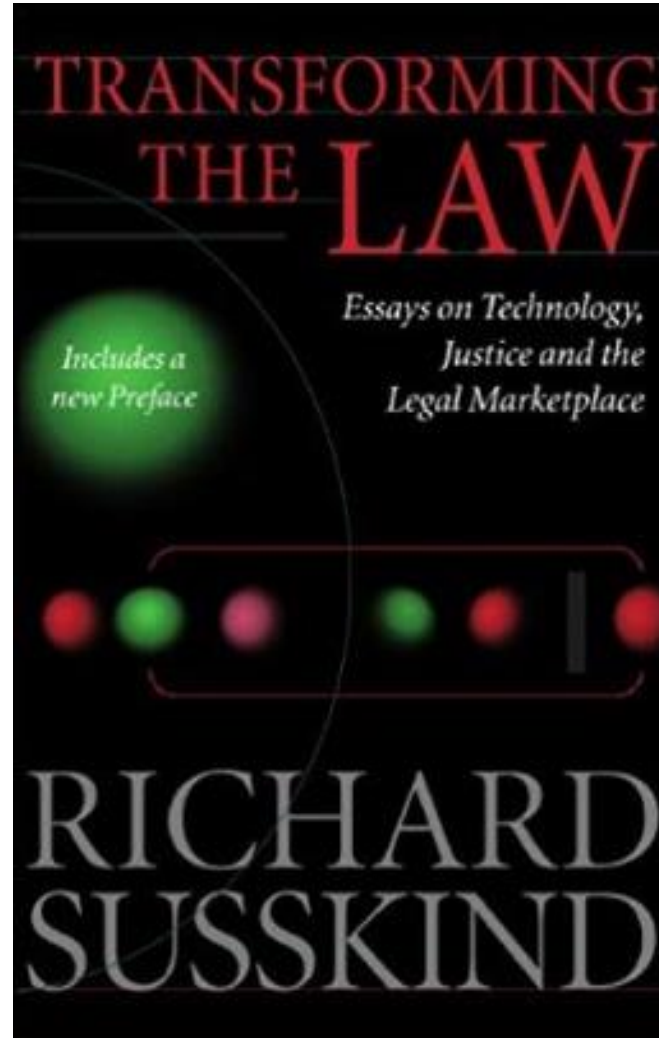


\* Numerous other researchers, esp. since 2010, are not shown in the fig.

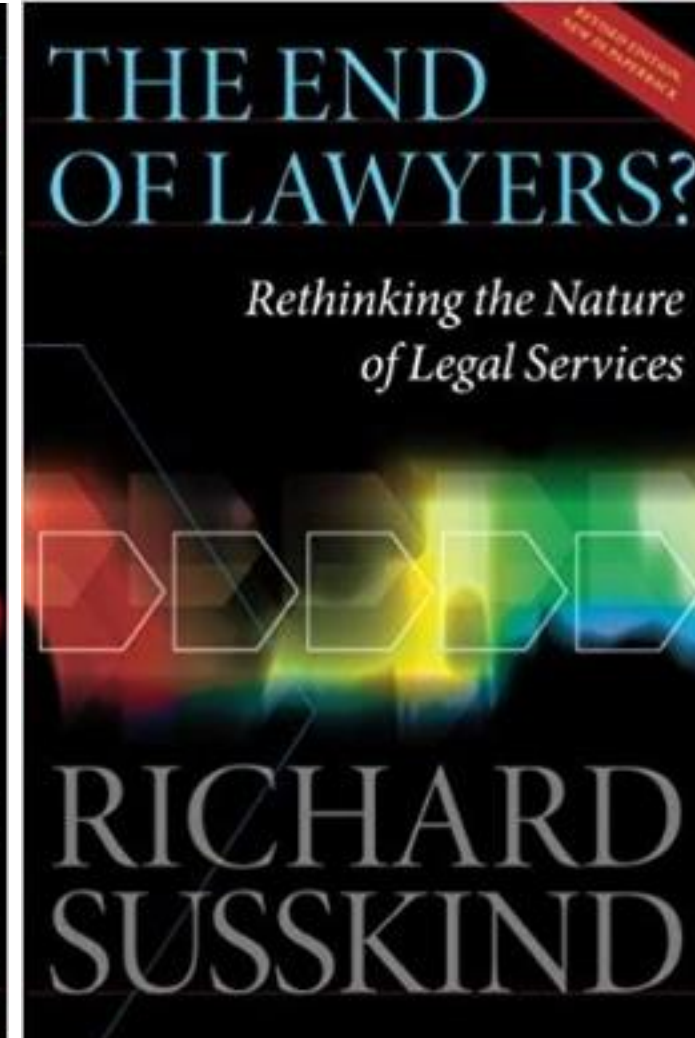
## Richard Susskind and AI & Law



1996



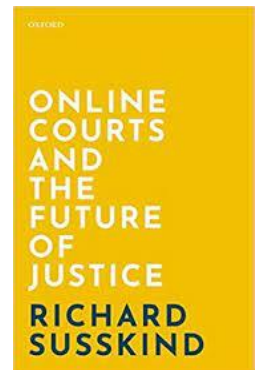
2000



2010



- Legal Services Visionary
- Author, Lecturer
- Advisor to Lord Chief Justice
- AI & Law Consultant



2019

# Noteworthy Early AI & Law Events

Among the earliest newsworthy activities in the community (1971 – 75)

## TAXMAN Dr. L. Thorne McCarty

- Work on project began while author was a Law and Computer fellow at Stanford Law School (1971-73), and supported by a grant from the IBM Corporation.
- Additional work was undertaken during a workshop at Stanford Law School in 1975
- Computer time for the project was provided by the Stanford Artificial Intelligence Laboratory
- The work introduced some novel ways of computer-based semantic processing developed in the field of Artificial Intelligence
- McCarty describes a computer program that uses techniques that enables a computer to apply certain fact situation concepts in the area of *corporate reorganization taxation*
- In his *Harvard Law Review* article, he considers both the limitations of the program and the means by which it may be feasibly improved
- He further argues that if developed further, by means of increasingly sophisticated techniques, it may prove of practical use to a lawyer

VOLUME 90

MARCH 1977

NUMBER 5

### HARVARD LAW REVIEW

#### REFLECTIONS ON TAXMAN: AN EXPERIMENT IN ARTIFICIAL INTELLIGENCE AND LEGAL REASONING †

L. Thorne McCarty.\*

*After introducing some basic techniques of semantic information processing developed in the field of artificial intelligence, Professor McCarty describes a computer program using such techniques which enables a computer to apply to certain fact situations concepts of the area of the taxation of corporate reorganizations. He considers both the present limitations of the program and ways in which it might feasibly be improved, and argues that if developed further by means of increasingly sophisticated techniques, it may prove of practical use to tax lawyers. The development of such computer models also has a dual theoretical purpose. It clarifies the structure of the area of law modeled, and the investigation of the limits of such models provides the foundation for a theory of the nature of legal concepts.*

# Noteworthy Early AI & Law Events

Among the earliest newsworthy activities in the community (1990 – 93)

## WIN (Westlaw is Natural) Dr. Howard Turtle

- Worked in the Center for Intelligent Information Retrieval (CIIR) at UMass - Amherst while a PhD grad student under Prof. Bruce Croft
- Designed & implemented the **Inquiry** natural language search engine as part of his PhD program
- Using Bayesian inference nets and tf.idf term & phase scoring, produced the first natural language search engine that could scale
- Was hired by West Publishing Co. (Westlaw) upon graduation.
- At West, led a secret project to productionize *Inquiry*, making it arguably the world's the first industrial natural language search engine, which was known as '**WIN**'
- Launched in 1992, in a pre-web world, it became available to the 1 million attorneys in the U.S. by way of West's own proprietary network.
- Received *Online* magazine's "Product of the Year" award in 1992.
- *Inquiry* has been used for comparative IR experiments at CIIR over the three decades since Dr. Turtle's tenure at UMass.
- Related reference: <https://dl.acm.org/doi/10.5555/188490.188559>

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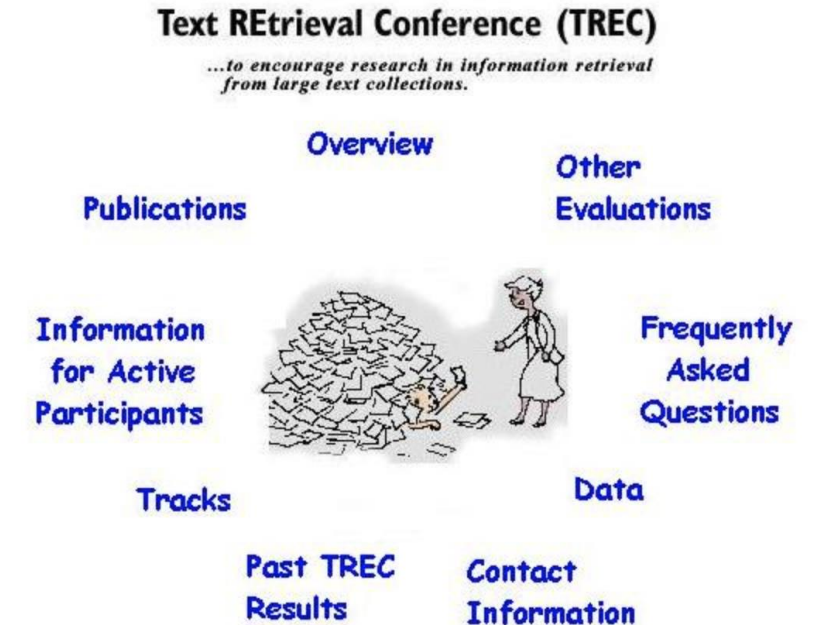
# Noteworthy Past AI & Law Events

Among the newsworthy activities within the community (2006 – )

## TREC (Text Retrieval Conference) for Legal (E-Discovery)

Jason Baron JD, Dr. Doug Oard, Dr. David Lewis, Gordon Cormack, et al.

- Sponsored by the National Institute for Standards and Technology (NIST) in US
- Goal is to evaluate the ability of IR techniques meet the needs of the legal profession.
- It is especially focused on tools and methods to help retrieve electronic business records, principally for use as evidence in civil litigation, a.k.a., “e-Discovery.”
- Each year’s ‘task’ involves three phases that include planning, experimentation, and reporting.
- Prior tasks have addressed e-Discovery needs and performance against the Philip Morris tobacco settlement collection, end-to-end system evaluation, an interactive task, a learning task, a total recall task, and others.
- As a research community, TREC largely relies on volunteers to conduct its trials.
- Following the research task for any given year is an invitation-only conference for participants.
- Related references:
  - <https://trec-legal.umiacs.umd.edu/>
  - <http://users.umiacs.umd.edu/~oard/desi7/#History>



## TREC Legal Track

[About](#) | [2012](#) | [2011](#) | [2010](#) | [2009](#) | [2008](#) | [2007](#) | [2006](#) | [Papers](#) | [Other](#)

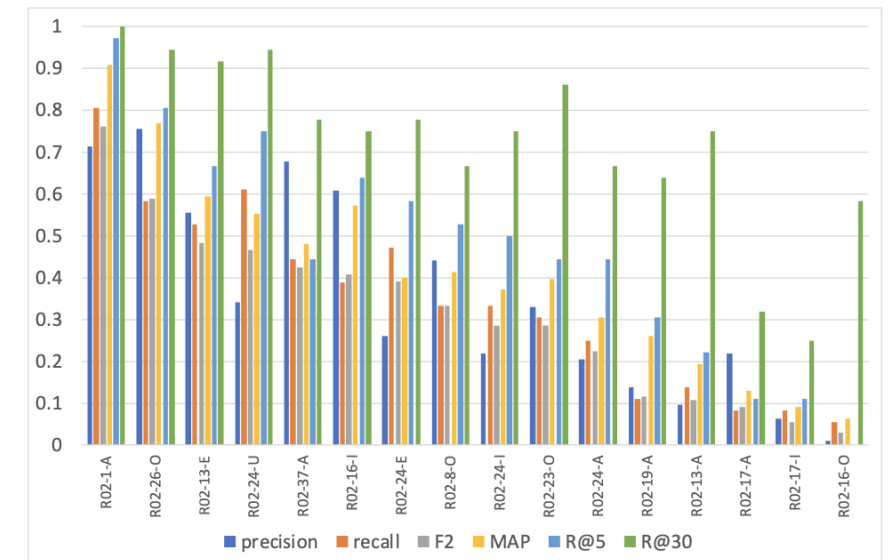
# Noteworthy Past AI & Law Events

Among the newsworthy activities within the community (2014 – )

## COLIEE (Competition on Legal Information Extraction/Entailment)

Randy Goebel, Ken Satoh, Juliano Rabelo, Yoshinobu Kano, et al.

- The most significant and longest running legal NLP competition in existence.
- Has historically been run against Japanese legal data, though with an accompanying translated English language collection.
- Participating teams can decide which collections they wish to work with.
- There are generally up to five tasks run per year, which have included tasks such as:
  - Task 1: Information retrieval for caselaw
  - Task 2: Confirmation of entailment relation between an existing case and an unseen one
  - Task 3: Information retrieval task for statutes
  - Task 4: Entailment/question answering task on retrieved civil code statutes
  - Task 5: Entailment/question answering task without retrieved civil code statutes
- The competition takes place each year. Participation is open to any group.
- Participants are invited to attend a workshop to report on their results after each competition. It is co-located with ICAIL in odd years and with JURISIN in even years.
- Related reference: <https://sites.ualberta.ca/~rabelo/COLIEE2023/>



Statute retrieval task: Averages of precision, recall, F2, MAP, R 5, R 10, and R 30 for non-easy questions with a single relevant article.

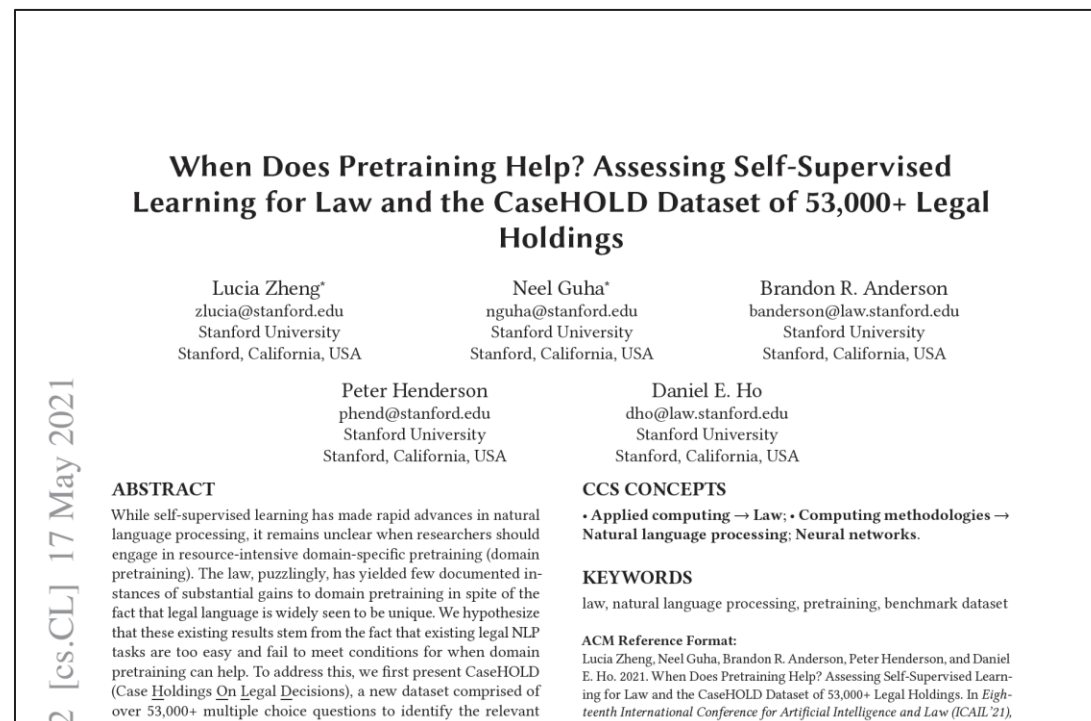
# Noteworthy Past AI & Law Events

Among the newsworthy activities within the community (2021)

## Optimizing the Role of Training

L. Zheng, N. Guha, B. Anderson, P. Henderson, D. Ho

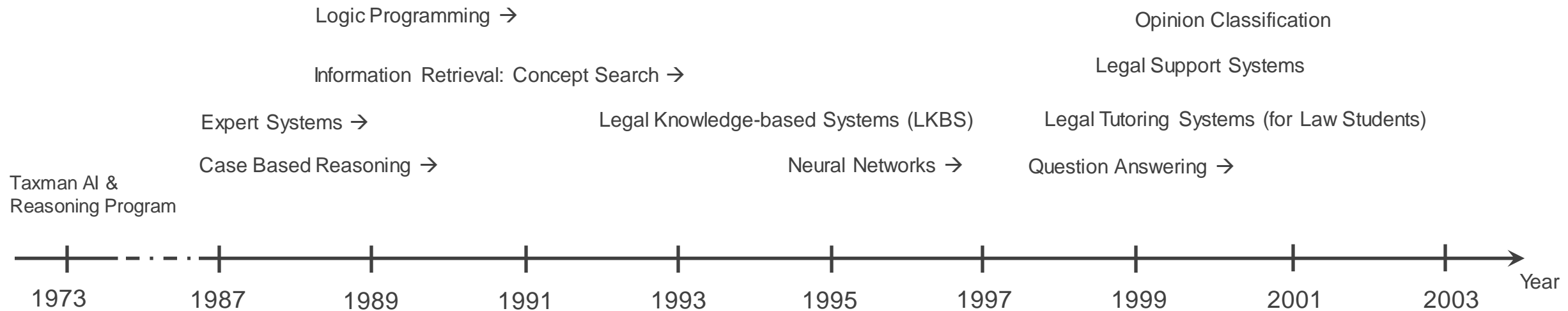
- Observe that it remains unclear when researchers should rely on domain-specific resource-intensive pre-training
- Legal applications have shown few examples of substantive gains when domain pre-training has been used
- Hypothesize that current results come from legal tasks that are too easy, fail to meet conditions when legal pre-training can help
- Present a new dataset [CaseHOLD (Table 2)] consisting of 53K+ multiple choice questions to identify the relevant holding in a case
- Claimed to be a representative and difficult challenge
- Subsequently measure performance NLP tasks gains on CaseHOLD and other datasets
- Show that legal domain pre-training with custom vocab. outperforms BERT pre-trained on a general corpus
- Show domain pre-training may be warranted when task is similar to the pre-training corpus
- Reference: <https://dl.acm.org/doi/abs/10.1145/3462757.3466088>



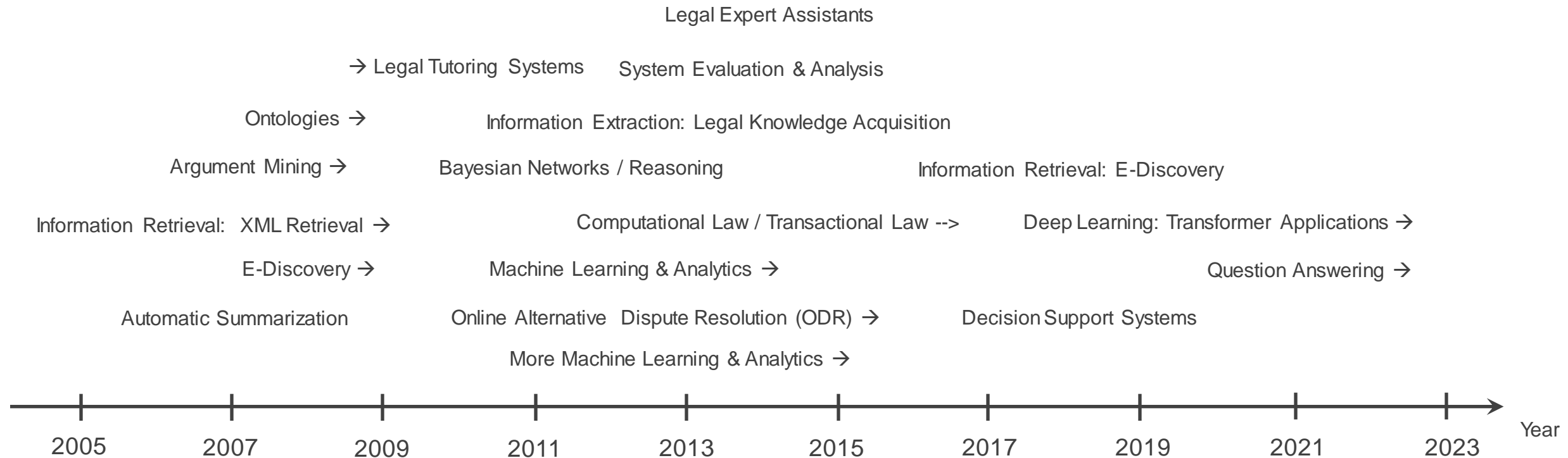
# 35+ Years of AI and Law



# AI & Law across 4+ decades (1985-2003)



# AI & Law across 4+ decades (2005-2023)



# AI & Law: Beyond Foundations

What's been the impact of the community on the field?

Via IAAIL.org sponsored

- Conferences
- Workshops
- Proceedings
- Journal



Answer: *Mixed*

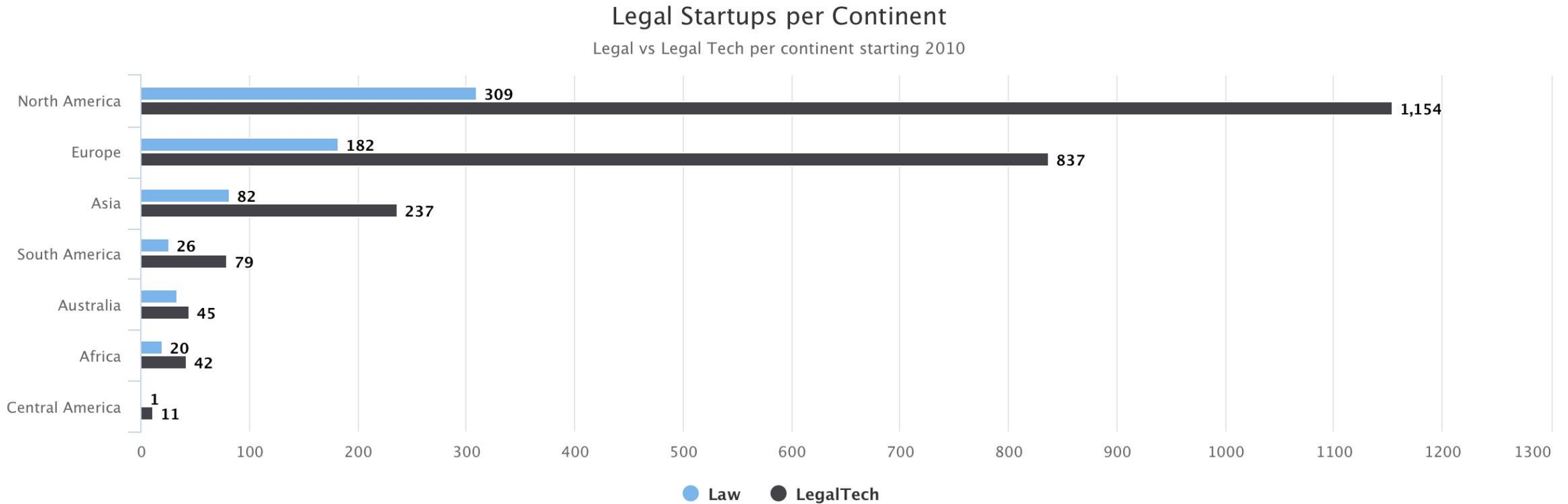
- ICAIL and its workshops have showcased commercial successes, start-ups, luminaries
  - E.g., WIN (first NL vers. of Westlaw), Lex Machina (Stanford start-up now part of Lexis Nexis), seminal E-Discovery works in series of 7 'DESI' workshops
- But a large amount of activity in the AI - Legal domain in pockets outside IAAIL
  - E.g., CodeX (Stanford's Center for Legal Informatics) and especially in the startup space

# The Role of Legal Start-ups



# Legal Startups

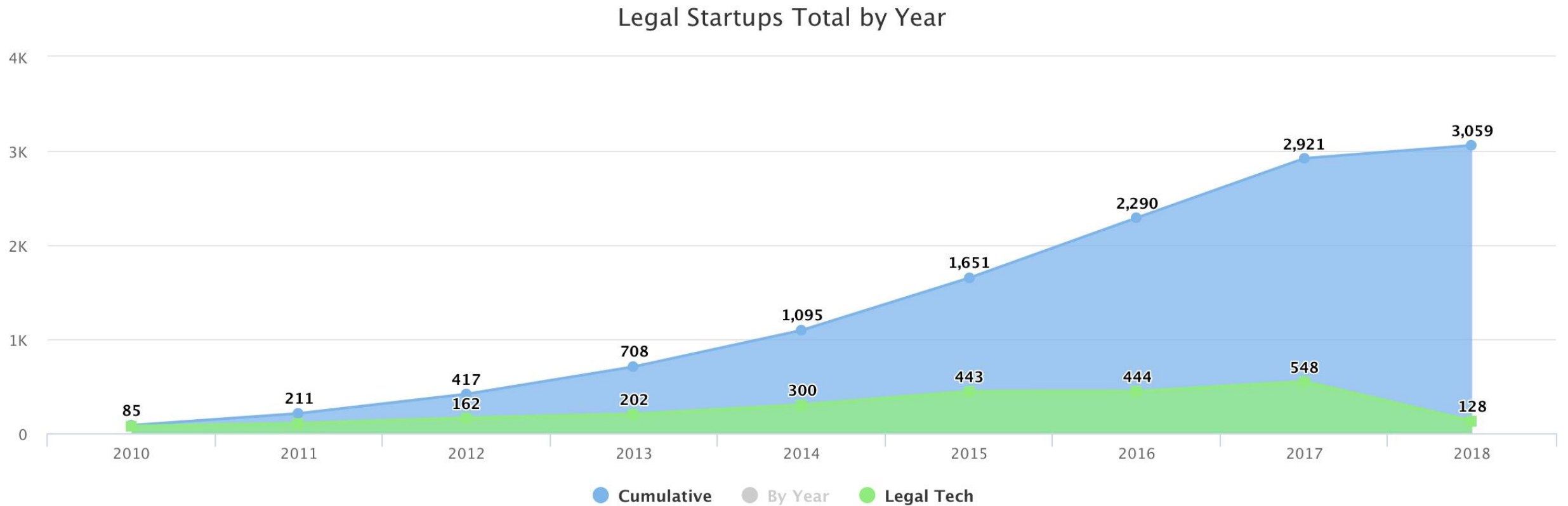
## By Continent



Angel.co, Crunchbase etc

# Legal Startups

## By Year



Angel.co, Crunchbase etc

## Legal Startups – The Rest of the Story

<https://www.legalcomplex.com/blog/2015/12/29/legal-startups-charts/>

- Fill gaps in on-going research
- Tend to be highly focused
  - Address specific practitioner needs / problems
  - E.g., distribution of motions in the treatment of a course of litigation
- Often begin with a single jurisdiction or a specific legal practice area
  - E.g., California or IP
- Base next steps on past performance
  - Tied to likelihood of obtaining added funding
  - Trade-offs between expanded coverage and accuracy / value of results



# From Past to Present



# AI and Law – the Progression

## Foundations

- Grand visions (like AI as a whole)
- Much focus on
  - Legal knowledge representation
  - Formal & computational models of reasoning, based largely on inference and argumentation
  - Emphasis also on legal interpretation, decision making
  - Some models developed with domain experts
- Early systems rule-based, e.g., ‘TaxMan’
- Applications often focused on narrow sub-domains, e.g., trademark infringement

## Today and into the Future

- Increasingly data-driven
  - Harness large & ever-growing data repositories
- Approaches to legal analysis has changed
  - It’s now more empirical, corpora-based
- Underlying models statistical in nature
  - Semantic, citation-based, or temporal patterns
  - Data-centric techniques enable new algorithmic approaches to legal problem solving
- Analysis continues to leverage core NLP, data mining, and machine learning
  - Deep Learning / Neural Networks making increasingly significant progress
  - LLMs currently taking the world by storm



# A Brief History of AI & Law: Key Milestones for Legal IR & NLP

**Thank you.**

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