ARTIFICIAL INTELLIGENCE:

Thinking About Law, Law Practice, and Legal Education

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SENSITIVITY AND SPECIFICITY IN DISCOVERY: WHAT ARTIFICIAL INTELLIGENCE CAN OFFER

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ABOUT ME

• Professor of Computer Science, Duquesne U.
• Ph.D (Computer Science), U. Colorado, 1995
• More than 200 scholarly articles
• Testimonial experience in U.S. Federal, State, England/Wales, and BIT Arbitration
FINDING THE EVIDENCE

Somewhere, in a mass of documents, is the evidence to prove your theory of the case.
BUT WHERE IS IT?

- The Enron scandal [Arthur Andersen LLP v. United States, 544 U.S. 696 (2005); United States v. Skilling, 554 F.3d 529 (2009)] involved 600,000 pieces of email.

- The Chevron Lago Agrio litigation [Chevron Corporation and Texaco Petroleum Corporation v. The Republic of Ecuador; UNCITRAL, PCA Case No. 2009-23; Chevron v. Donziger, et al., 14-0826(L), 14-0832(C), 2016 WL 4173988 (2d Cir. Aug. 8, 2016)] involved more than 200,000 pages of documentation, in multiple languages, mostly Spanish.
THREE WAYS TO LOOK

• Hire a battalion of legal researchers
  • Slow and expensive,… but traditional

• Use dumb computer help
  • I hope you picked the right keywords!

• Use smart computer help
  • AI can make “human-like” decisions
OPTICAL CHARACTER RECOGNITION ("OCR")

- AI application ("deep learning") since mid-80s
- Learns by example what characters correspond to what images
CAN WE TRUST THE COMPUTER?

• Everyone makes mistakes. Computers do, but so do people. (Can you read medieval manuscripts?)

• Part of AI research is determining the sensitivity and specificity of any method via controlled tests
  • Can be compared to human performance; often beats humans!
SENSITIVITY AND SPECIFICITY

• Sensitivity is the ability to detect what is there. The opposite is a “false negative” error – missing something.

• Specificity is the ability to reject what isn’t there. The opposite is a “false positive.”

• We can trade these off, but we really want both.

• For OCR, mediocre is 95%, good is 98%
APPLICATION: CHEVRON

• Massive Ecuadorian judgment against Chevron, allegedly obtained by fraud

• Judge (may have) issued ”ghost-written” decision

• If external authorship could be demonstrated, fraud would be proven

• But how to show who wrote a document?
We know a lot about authorship and style. Different people use words differently.

In fact, it’s vanishingly rare for two people to independently use the same lengthy (7 word) phrases (unless they’re quoting).

Example: The first sentence of my abstract, “evidence is, of course, key to resolving legal disputes” appears nowhere on Google.

So if we can find any shared passages, there is common authorship.
FINDING THE NEEDLE

• Three primary document sets of interest.
  • The court record (legitimate sources)
  • Other attorney’s work product (obtained via court order)
  • The judgment itself

• Compare all sets of documents – 100,000s of pages – with the text of the judgment
  • Task for computer
  • Problem: many documents are scanned, so can’t be read by computer without OCR
OUR ANALYTIC RESULTS

• The team used “fuzzy” matching to find similarly written passages

• We found many lengthy passages in the judgment shared with various work-product documents, some with more than 100 identical words

• Those passages were not found either in the court record or Google. Apparently attorney work product.
... BUT HOW DO WE KNOW?

• Remember the OCR accuracy numbers?
• Even "bad" OCR is generally 70% accurate.
• Any two passages in the same language will share some words and letters (think "the")
• ... but the closest matches in the court record were only about 50% overlap (and didn’t have any obvious errors).
Judgment

~100% similarity

Plaintiff’s AWP

Chance-level similarity

Court Record

Chance-level similarity
TAKE HOME LESSONS:

• Sophisticated AI can do human-level work at computer-level speeds

• Computer programs can be tested to produce known error rates. (Often easier than testing humans!)

• The key to using AI properly is to know (and understand) the error rates.
OTHER APPLICATIONS (THANKS TO JANET AINSWORTH, SEATTLE U.)

• Document production: assessing relevance (TAR)
• Contracts analytics ("you forgot the mandatory arbitration provision!")
• Predicting case viability (*)
• Drafting briefs (*)
• Debate preparation (*)
ACCURACY IS THE KEY

• Predicting outcomes of civil trials (UK)
  • 755 cases (PPI mis-selling)
  • 112 human lawyers
  • 1 computer program

• The computer got 86% of them right

• The humans got 62.3% of them right
OH, I ALMOST FORGOT

• A lot went into the Chevron case (no expert witness ever wins a case on his own)

• … but Judge Kaplan (S.D.N.Y.) was convinced. “If ever there were a case warranting equitable relief with respect to a judgment procured by fraud, this is it.”

• … thanks in part to AI-based analysis
• Juola & Associates specializes in the application of AI and text analysis to questions of disputed authorship for court cases.

• We have a text service that can meet your needs. If not, we can create it.

• HTTP://WWW.JUOLAASSOCIATES.COM