



Information Retrieval Evaluation in the Real-World: A Legal Tech Perspective



Adam Roegiest
VP, Research and Technology



Positionality Statement

PhD from University of Waterloo focusing on electronic discovery

Coordinator for the TREC Total Recall track

Transitioned immediately to industry (Kira)

Ran the gamut at Kira (research, development, product management)

Worked with lawyers on a daily basis for a large portion of my career

Focus has been on civil/corporate law rather than criminal

This talk overly simplifies a lot of legal concepts



What is evaluation?

Goal: Determine if a user's anomalous state of knowledge is likely to have been satisfied using a given system

- This is usually determined by the relevance of documents returned

Different models of user satisfaction that incorporate additional signals:

- Time constraints
- Effort required
- Cost of actions

The contrast:

- In much of traditional IR evaluation, relevance is key
- In “real-world” IR evaluation, constraints/context can have more impact



Contract Analysis





3COM CORPORATION

MANAGEMENT RETENTION AGREEMENT

Amended and Restated as of July 15, 2003

This Management Retention Agreement (the "Agreement") is made and entered into by and between Bruce Claflin (the "Employee") and 3Com Corporation (the "Company"), amended and restated effective as of July 15, 2003 (the "Effective Time").

RECITALS

- A. It is expected that the Company from time to time will consider the possibility of an acquisition by another company or other change of control. The Board of Directors of the Company (the "Board") recognizes that such consideration can be a distraction to the Employee and can cause the Employee to consider alternative employment opportunities. The Board has determined that it is in the best interests of the Company and its stockholders to assure that the Company will have the continued dedication and objectivity of the Employee, notwithstanding the possibility, threat or occurrence of a Change of Control (as defined herein) of the Company.
- B. The Board believes that it is in the best interests of the Company and its stockholders to provide the Employee with an incentive to continue his employment and to motivate the Employee to maximize the value of the Company upon a Change of Control for the benefit of its stockholders.
- C. Employee and the Board, upon reviewing Employee's Management Retention Agreement as in effect prior to this amendment and restatement (the "Prior Agreement"), determined that payments and benefits were likely to have been made thereunder pursuant to the Company's restructuring. Thereafter, Employee and the Board agreed to eliminate substantially all of the benefits otherwise payable under the Prior Agreement pursuant to the Company's restructuring. The Board continues to believe that it is imperative to provide the Employee with benefits upon a Change of Control (and upon certain terminations of employment prior to a Change of Control) which provides the Employee with enhanced financial security and provides incentive and encouragement to the Employee to remain with the Company notwithstanding the possibility of a Change of Control. The Board also believes that it is important to provide meaningful long-term incentives to Employee to remain with the Company.
- D. Certain capitalized terms used in the Agreement are defined in Section 6 below.
- E. Employee and the Company are parties to an Employment Agreement dated December 22, 2000, as may be modified or amended from time to time by the mutual written agreement of the parties (the "Employment Agreement"). References in the Employment Agreement to the "Management Retention Agreement" shall be deemed to refer to the Management

Retention Agreement as amended and restated as of July 15, 2003 or as may be further modified or amended from time to time by the mutual written agreement of the parties.

The parties hereto agree as follows:

1. Term of Agreement. This Agreement shall terminate upon the date that all obligations of the parties hereto with respect to this Agreement have been satisfied.
2. At-Will Employment. Subject to the Company discharging any of its obligations to provide Employee with payments and benefits under the Employment Agreement and this Management Retention Agreement, the Company and the Employee acknowledge that the Employee's employment is and shall continue to be at-will, as defined under Massachusetts law, and may be terminated by either party at any time, with or without cause. If the Employee's employment terminates for any reason, including (without limitation) any termination more than 3 months prior to a Change of Control, the Employee shall not be entitled to any payments, benefits or compensation other than as provided by this Agreement, the Employment Agreement, or as may otherwise be available in accordance with the Company's established employee plans or pursuant to other written agreements with the Company.
3. Retention Arrangement.
 - (a) Deferred Compensation Plan Account Credit. No later than October 31, 2003, the Company will credit Employee's account in the 3Com Deferred Compensation Plan with an amount equal to (i) two hundred percent (200%) of the Employee's Annual Compensation, plus (ii) one hundred percent (100%) of Employee's Target Bonus as in effect for the 2004 fiscal year, pro-rated by multiplying such Target Bonus amount by a fraction, the numerator of which shall be the number of Company 2004 fiscal year days elapsed on July 15, 2003, and the denominator of which shall be three-hundred and sixty-five (the "Retention Benefit"); provided, however, that if Employee remains with the Company through the end of the 2004 fiscal year, then the Company may subtract the gross pro-rated amount previously credited to Employee's account pursuant to this paragraph from the gross annual target bonus amount otherwise payable to Employee on account of the 2004 fiscal year; provided, further, that on each vesting date, Employee's Deferred Compensation Plan account will be debited in an amount equal to the employee-side Medicare amounts paid out by 3Com on account of such vesting.
 - (b) Retention Benefit Vesting.
 - (i) Vesting. Employee shall vest as to one-third (1/3) of the Retention Benefit (and proportional earnings and losses thereon) upon each anniversary of the Effective Time, so as to be 100% vested on July 15, 2006, subject to Employee remaining employed by the Company on each vesting date. However, the Retention Benefit shall vest earlier as to 100% upon (i) a Change of Control, (ii) subject to Employee entering into a mutual release of claims with the Company in substantially the form attached hereto as Exhibit A, as updated to reflect different applicable state and federal laws (a "Release") Employee's termination by the Company other than for Cause, (iii) subject to Employee entering into a Release, Employee's termination for Good Reason, or (iv) Employee's termination of employment pursuant to Employee's death or Disability; provided, that with respect to the pro-rated Target Bonus portion of the Retention Benefit, such amount shall vest, if earlier, upon the last day of the Company's 2004 fiscal year so long as Employee remains employed with the Company through such date. If the Employee does not remain employed with the Company through a Retention Benefit vesting date, the unvested Retention

(c) No Dual Benefits. In the event that Employee receives benefits pursuant to Section 4(a)(iii) or 4(a)(iv) hereof, he shall not be entitled to receive severance benefits pursuant to the Employment Agreement or the Section 16 Severance Plan.

5. Golden Parachute Excise Tax Full Cross-Up. In the event that the benefits provided for in this Agreement or otherwise payable to the Employee constitute "parachute payments" within the meaning of Section 280G of the Internal Revenue Code of 1986, as amended (the "Code") and will be subject to the excise tax imposed by Section 4999 of the Code, then the Employee shall receive (i) a payment from the Company sufficient to pay such excise tax, plus (ii) an additional payment from the Company sufficient to pay the excise tax and federal and state income and employment taxes arising from the payments made by the Company to Employee pursuant to this sentence. Unless the Company and the Employee otherwise agree in writing, the determination of Employee's excise tax liability and the amount required to be paid under this Section 5 shall be made in writing by the Company's independent auditors who are primarily used by the Company immediately prior to the Change of Control (the "Accountants"). For purposes of making the calculations required by this Section 5, the Accountants shall assume that applicable taxes are applied at the maximum rates provided by law and may rely on reasonable, good faith interpretations concerning the application of Sections 280G and 4999 of the Code. The Company and the Employee shall furnish to the Accountants such information and documents as the Accountants may reasonably request in order to make a determination under this Section. The

Company shall bear all costs the Accountants may reasonably incur in connection with any calculations contemplated by this Section 5.

6. Definition of Terms. The following terms referred to in this Agreement shall have the following meanings:

- (a) Annual Compensation. "Annual Compensation" shall mean an amount equal to the sum of (i) the Employee's Company annual base salary as in effect immediately preceding the Change of Control or Retention Benefit payment, as applicable, and (ii) 100% of the Employee's Target Bonus.
- (b) Cause. "Cause" shall mean (i) an act of personal dishonesty taken by the Employee in connection with his responsibilities as an employee and intended to result in substantial personal enrichment of the Employee, (ii) Employee being convicted of a felony, (iii) a willful act by the Employee which constitutes gross misconduct and which is injurious to the Company, (iv) following delivery to the Employee of a written demand for performance from the Company which describes the basis for the Company's reasonable belief that the Employee has not substantially

5

performed his duties, continued violations by the Employee of the Employee's obligations to the Company which are demonstrably willful and deliberate on the Employee's part.

(c) Change of Control. "Change of Control" means the occurrence of any of the following events:

- (i) Any Person becomes the "beneficial owner" as defined in Rule 13d-3 under the Securities Exchange Act of 1934, as amended ("Beneficial Owner"), directly or indirectly, of securities of the Company representing fifty percent (50%) or more of the total voting power represented by the Company's then outstanding voting securities; or
- (ii) the consummation of the sale or disposition by the Company of all or substantially all the Company's assets; or
- (iii) The consummation of a merger or consolidation of the Company with any other corporation, other than a merger or consolidation which would result in the voting securities of the Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity) at least fifty percent (50%) of the total voting power represented by the voting securities of the Company or such surviving entity outstanding immediately after such merger or consolidation; or
- (iv) A change in the composition of the Board occurring within a two-year period, as a result of which fewer than a majority of the directors are Incumbent Directors. "Incumbent Directors" shall mean directors who either (A) are directors of the Company as of the date upon which this Agreement was entered into, or (B) are elected, or nominated for election, to the Board with the affirmative votes of at least a majority of those directors whose election or nomination was not in connection with any transaction described in subsections (i), (ii), or (iii) above, or in connection with an actual or threatened proxy contest relating to the election of directors to the Company.
- (d) Disability. "Disability" shall mean that the Employee has been unable to perform his Company duties as the result of his incapacity due to physical or mental illness with reasonable accommodation, and such inability continues at least 26 weeks and after the end of the twenty-six (26) week period, the disability is determined to be total and permanent by a physician selected by the Company or its insurers and acceptable to the Employee or the Employee's legal representative (such Agreement as to acceptability not to be unreasonably withheld). Termination resulting from Disability may only be effected after at least 30 days' written notice by the Company of its intention to terminate the Employee's employment. In the event that the Employee resumes the performance of substantially all of his duties hereunder with or without reasonable accommodation before the termination of his employment becomes effective, the notice of intent to terminate shall automatically be deemed to have been revoked.
- (e) Materially Competes With the Company. "Materially Competes With the Company" shall mean engaging in any business activity (whether as an employee, consultant, proprietor, partner, director or otherwise) that materially competes with the Company or its affiliates, including the Huawei joint venture if the Company is then a major shareholder of same (the "Affiliates"), including developing, selling, marketing, manufacturing, licensing, or distributing products or services that are competitive with the products and services being developed, sold, marketed, manufactured, licensed, or distributed by the Company or its Affiliates at the time Employee's employment terminates; or owning a material interest in, or materially participating in



Understanding Contracts

Contract analysis seeks to help individuals and businesses understand their rights, obligations, and responsibilities by surfacing these details more easily with less human effort

If an employee moves from Delaware to California, is their non-compete enforceable?

Should a developer be tracking hours when supporting a customer so that they can be billed?

If the company is being acquired, does it need the consent of any customers?

How much (and when) should a customer be charged for overages?

Should be easy, right?



Clause Agreement

Pri.	Sec.	Recall	Precision
Gold	Lo	0.75 (0.03)	0.84 (0.08)
Gold	Hi	0.71 (0.03)	0.82 (0.07)
Lo	Lo	0.81 (0.04)	0.93 (0.02)
Hi	Lo	0.89 (0.02)	0.81 (0.02)
Hi	Hi	0.82 (0.03)	0.87 (0.04)

Better than Voorhees found in 2001!

"a practical upper bound on retrieval system performance is 65% precision at 65% recall since that is the level at which humans agree with one another."



Granular Agreement

Pri.	Sec.	gRecall	gPrecision
Gold	Lo	0.71 (0.04)	0.73 (0.11)
Gold	Hi	0.69 (0.04)	0.73 (0.11)
Lo	Lo	0.75 (0.05)	0.82 (0.04)
Hi	Lo	0.79 (0.02)	0.78 (0.02)
Hi	Hi	0.77 (0.04)	0.80 (0.04)

Still better than other studies but substantial decreases when we account for how much clauses overlap

Despite this, customers would complain that models were inaccurate



Ensuring Success

For the annotation experiment to be successful, we had to give precise details

To annotate for Assignment clauses:

- *capture permitted and prohibited assignments or transfers of the agreement, capture any exceptions*
- *you can include language about the agreement inuring to the benefit of successors/assigns*
- *include notice/consent requirements, termination rights, or anything else triggered on sales of substantially all assets*
- *exclude sub-contracting/sub-licensing if separate provisions (but fine to include if embedded in the assignment provision)*
- *exclude assignments for the benefits of creditors, agreements to assign IP*



Scope Matters

In traditional IR there's a shared understanding of "relevance"

Dealing with lawyers, there can be more room for interpretation

- Contracts are written with a specific shared intent, but subsequently interpreted to be as beneficial as possible for the reader

The actual purpose for the analysis will matter:

- Obligation tracking in business operations
- Buy-side review to look for risks or problematic issues
- Sell-side review to look for specific deal blockers



Electronic Discovery





Process by Law

The goal of electronic discovery is to allow the plaintiff controlled access to documents from the defendant that are relevant to the case

Tension between the parties on how best to facilitate this process

Can be viewed as an adversarial process

To mitigate issues with that quasi-adversarial nature, there are rules:

- In the USA, the Federal Rules of Civil Procedure
- In the UK, the Civil Disclosure Rules
- In Canada, depends on provincial versus federal jurisdiction



FRCP Rule 26(g)

(1) Signature Required; Effect of Signature. Every disclosure under Rule 26(a)(1) or (a)(3) and every discovery request, response, or objection must be signed by at least one attorney of record in the attorney's own name—or by the party personally, if unrepresented—and must state the signer's address, e-mail address, and telephone number. By signing, an attorney or party certifies that to the best of the person's knowledge, information, and belief formed after a reasonable inquiry:

(A) with respect to a disclosure, it is complete and correct as of the time it is made; and

(B) with respect to a discovery request, response, or objection, it is:

(i) consistent with these rules and warranted by existing law or by a nonfrivolous argument for extending, modifying, or reversing existing law, or for establishing new law;

*(ii) not interposed for any improper purpose, such as to **harass**, cause **unnecessary delay**, or **needlessly increase** the cost of litigation; and*

*(iii) neither **unreasonable** nor **unduly burdensome** or **expensive**, considering the **needs of the case**, prior discovery in the case, the amount in controversy, and the importance of the issues at stake in the action.*



Electronic Discovery

There are reasonableness and proportionality requirements regardless of jurisdiction

Often manifests in a target recall (e.g., 75% recall)

- In theory, the discovery process may be negotiated

Targets also play a dual role:

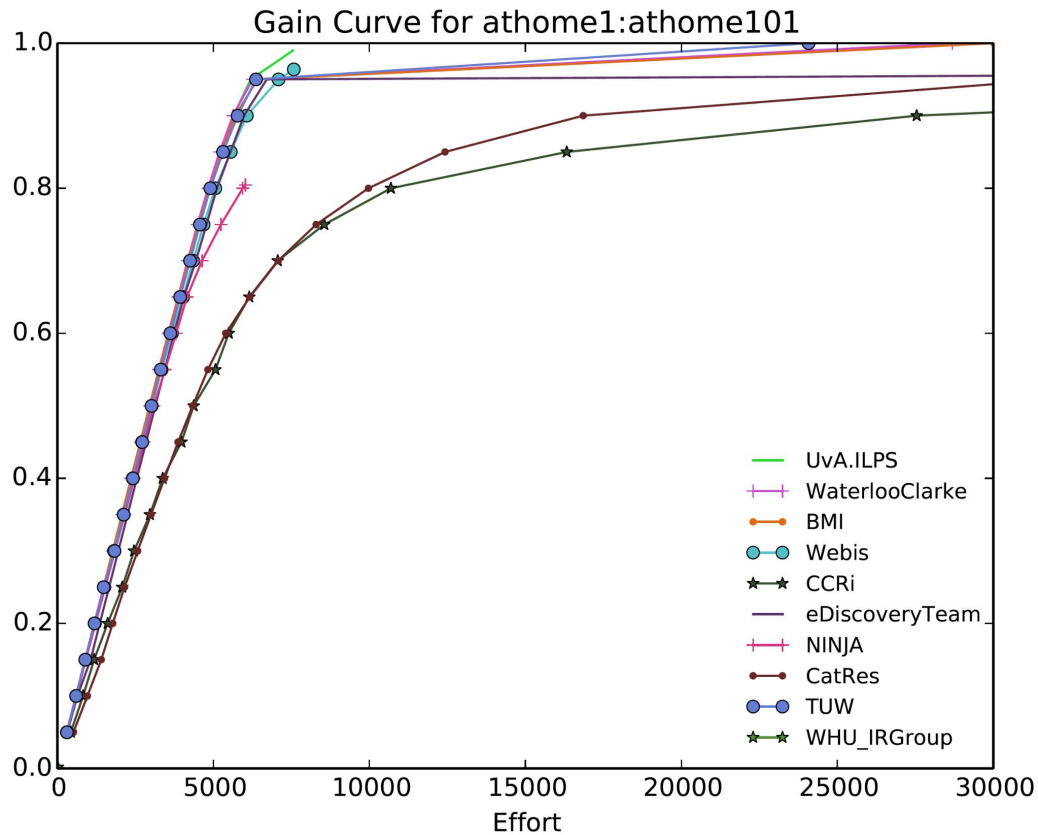
- That “enough” work went into the review (reasonableness)
- Control costs associated with the review (proportionality)

Gordon Cormack and Maura Grossman have focused on stopping criteria

Eugene Yang, David D. Lewis, and others have focused on cost models

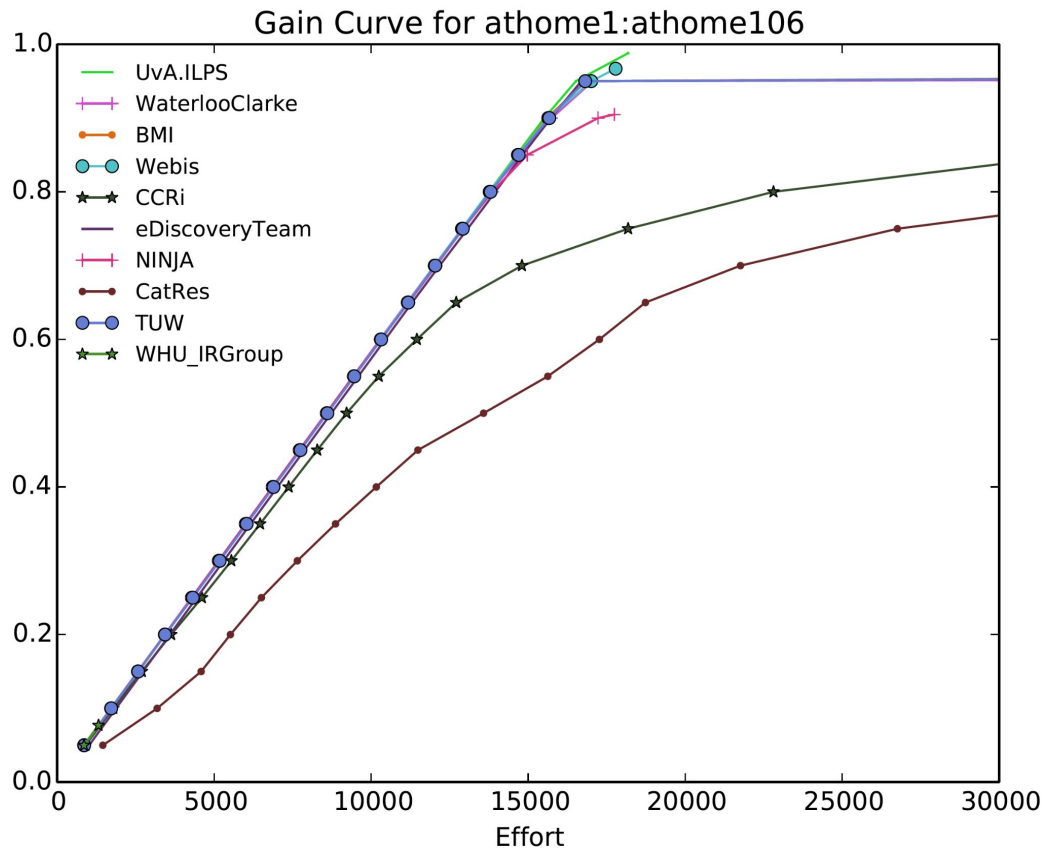


Recall-Effort Variability



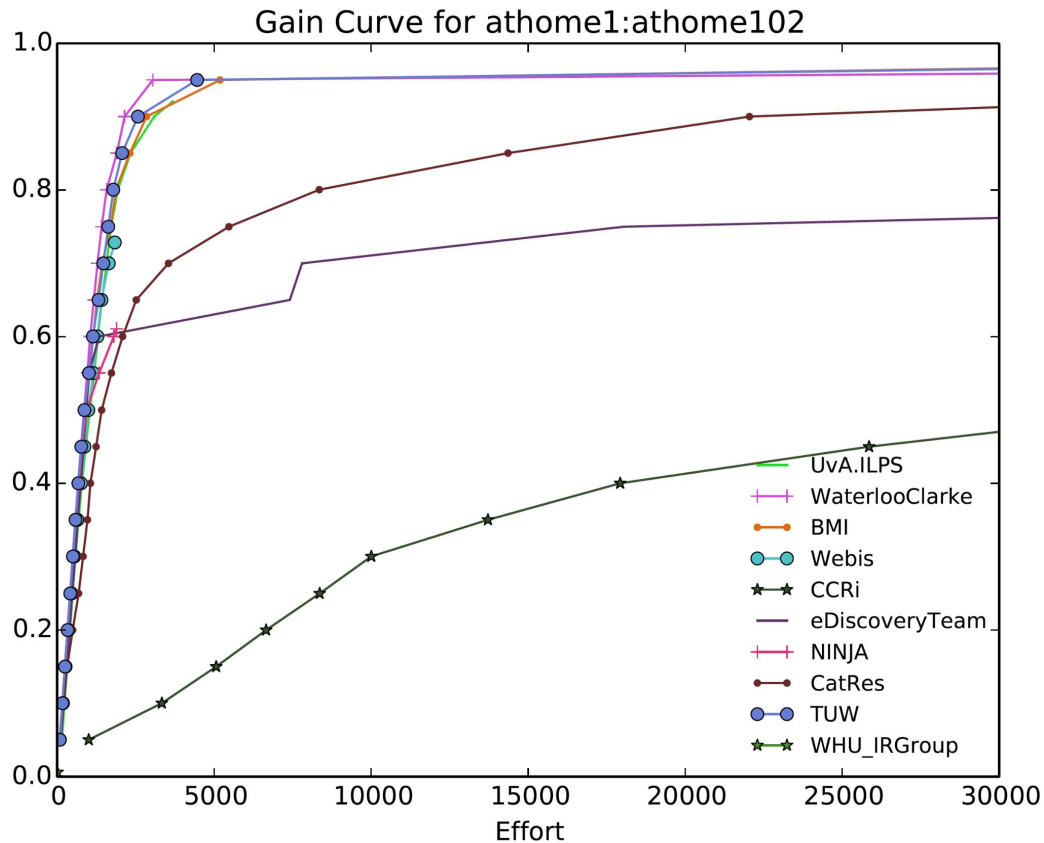


Recall-Effort Variability





Recall-Effort Variability





Discovery Difficulties

Costs are ultimately dependent on the case

- Any estimate of recall (or any metric) will always be lossy

Law firms are a **business** and want consistent revenue

Technology advancements make the task more efficient and reliable

Hard to balance between law, new advancements, and revenue

This makes adoption **hard**

- Despite over 20 years of research showing benefits of technology assistance
- If you'd like a more thorough rant, talk to **Jeremy Pickens**



Mergers and Acquisitions Due Diligence





M&A Due Diligence

When buying a company, you want to know how much risk is present and whether you should proceed or change your offer

In a short time window, lawyers will review some fraction of the target company's contracts

- Highest associated dollar value and other important agreements

The remaining contracts may never be thoroughly reviewed by *any one*

Not even the selling company

- They negotiated and signed them after all!



M&A Due Diligence

But problems can lurk in the unreviewed contracts

- Right of first refusal (i.e., give someone else the chance to buy first)
- Requirements for consent to assign/transfer the contract

For less important contracts, problems can delay the deal

- Money lost due to lower valuation, terminated contracts, less ideal environment

Law firms often perform diligence using a playbook

- Based on their expertise and experience

Making a review more *efficient* can be at odds with the revenue model of law firms



Goodness of Diligence

How do we evaluate how good a diligence review *ought* to be?

- Are there things to be found that normally aren't?

Given a desired budget, how should lawyer(s) prioritize their review?

- Ranked retrieval!

Except the “ideal” ranking is defined on a deal-by-deal basis

Evaluating a system could be tricky

- With defined criteria, how well does a system satisfy each criteria?
- Closer to traditional IR evaluation

But this is still a work in progress



Evaluation Between Systems





It doesn't happen



Except sometimes

“Independent” parties will sometimes conduct studies of legal IR systems.

Often these do not make for good marketing

- Stanford RegLab and HAI researchers stirred the pot last year

Sometimes, they do

- Vals AI produced two Legal AI reports this year
- tl;dr: GenAI is better than humans, we can all go home

But maybe with caveats

- Jeremy Pickens and I wrote commentary on the Vals report



Too long; feel asleep:

IR evaluation is already hard

Legal IR evaluation is complicated by even more nuanced user models

Constraints may be practical and/or mandated and/or revenue-driven

Relevance is already subjective; legal relevance is subjective to the individual and also the purpose

IR metrics will tell part of a story about your system, but will rarely be predictive of how (much) people will use it

- If they use it at all



The End

