

# How Can AI Strengthen Public Defense?

Dominik Stammbach (CITP)  
DMAIL@ICDM, November 14th, 2025

# Access to Justice

- Right to legal representation in criminal cases (6th Amendment)
- In practice: access to justice crisis

## To protect the public, we must reduce public defender caseloads

Sep. 18, 2024 at 3:55 pm

(from the Seattle Times)



## The human toll of America's public defender crisis

Years of drastic budget cuts have created bottomless caseloads for public defenders - the 'pack mules of the system' - and tipped the scales of justice against the poor

(from the Guardian)

POLITICS

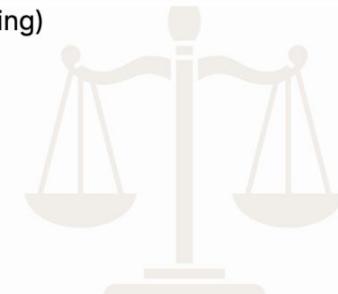
## Oregon public defenders warn of ongoing crisis as defendants remain without representation



By Lauren Dake (OPB)

Feb. 5, 2025 4:21 p.m.

(from Oregon Public Broadcasting)



# Roadmap

- The New Jersey BriefBank (collaboration with NJ OPD)
- Legal Retrieval for Public Defenders (Stammbach et al., 2025)
- Public Defenders' Perspectives on AI Adoption (Cheong et al., 2025)
- Insights and Takeaways

# The New Jersey BriefBank

# Background

- Ongoing Partnership with NJ Office of the Public Defender (NJ OPD)
  - How can AI assist public defense?
    - Responsible AI use case
    - Opportunities and risks of AI
- the NJ BriefBank

# Why BriefBank?

- Public defense work vs. other legal work
- Current Office practice
- Existing briefs cover
  - Overview legal landscape
  - Legal arguments
  - Applicable precedent, standards, rules
- From office perspective: defenders make more consistent arguments

# The NJ BriefBank

[https://huggingface.co/spaces/ai-law-society-lab/Briefbank\\_Demo](https://huggingface.co/spaces/ai-law-society-lab/Briefbank_Demo)

# (Backup Slide)

Can officers always order a passenger out of a car?

State Of New Jersey v. Robert Love, written by Alyssa Aiello, 2023

134 N.J. at 618. Rather, the Court held that "a police officer can "remove passengers **only when the circumstances present reason for heightened caution .**" *State v. Bacome*, 228 N.J. 94, 104 (2017) (reaffirming the *Smith* heightened-caution standard for removing passengers). An officer must articulate "facts in the totality of circumstances that would create in a police officer a heightened awareness of danger that would warrant an objectively reasonable officer in securing the scene in a more effective manner by ordering the passenger to alight from the car.

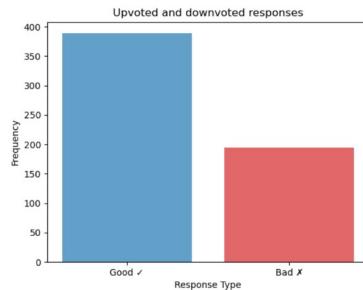
► [Expand to see additional search results from the same brief](#)

► [Expand to read an AI summary of the brief](#)

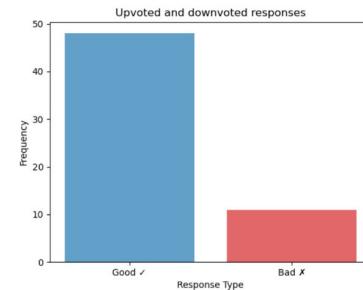


# System Overview

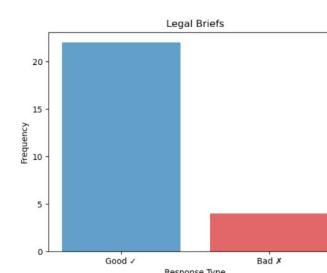
- Preprocessing
- Inference
  - Qwen3-8B-Embeddings and bm25
  - Fine-tuned Qwen3-8B-Reranker
  - Recency reranking
  - Display results
- Iterative development and evaluation rounds



First round (February)

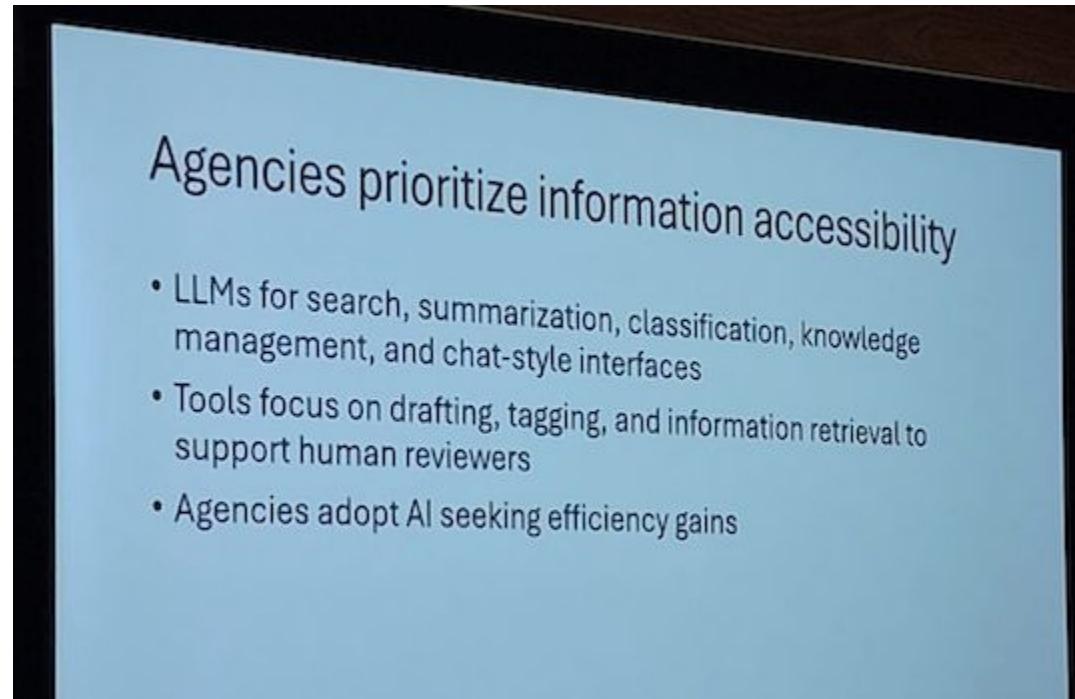


Second round (April)



Third round (June)

# AI Applications in Government Agencies



- LLMs for search, summarization, classification, knowledge management, and chat-style interfaces
- Tools focus on drafting, tagging, and information retrieval to support human reviewers
- Agencies adopt AI seeking efficiency gains

# Legal Retrieval for Public Defenders

**Dominik Stammbach<sup>1,†</sup>, Kylie Zhang<sup>1</sup>, Nimra Nadeem<sup>1</sup>, Lucia Zheng<sup>2</sup>, Peter Henderson<sup>1</sup>**

<sup>1</sup> Princeton University

<sup>2</sup> Stanford University

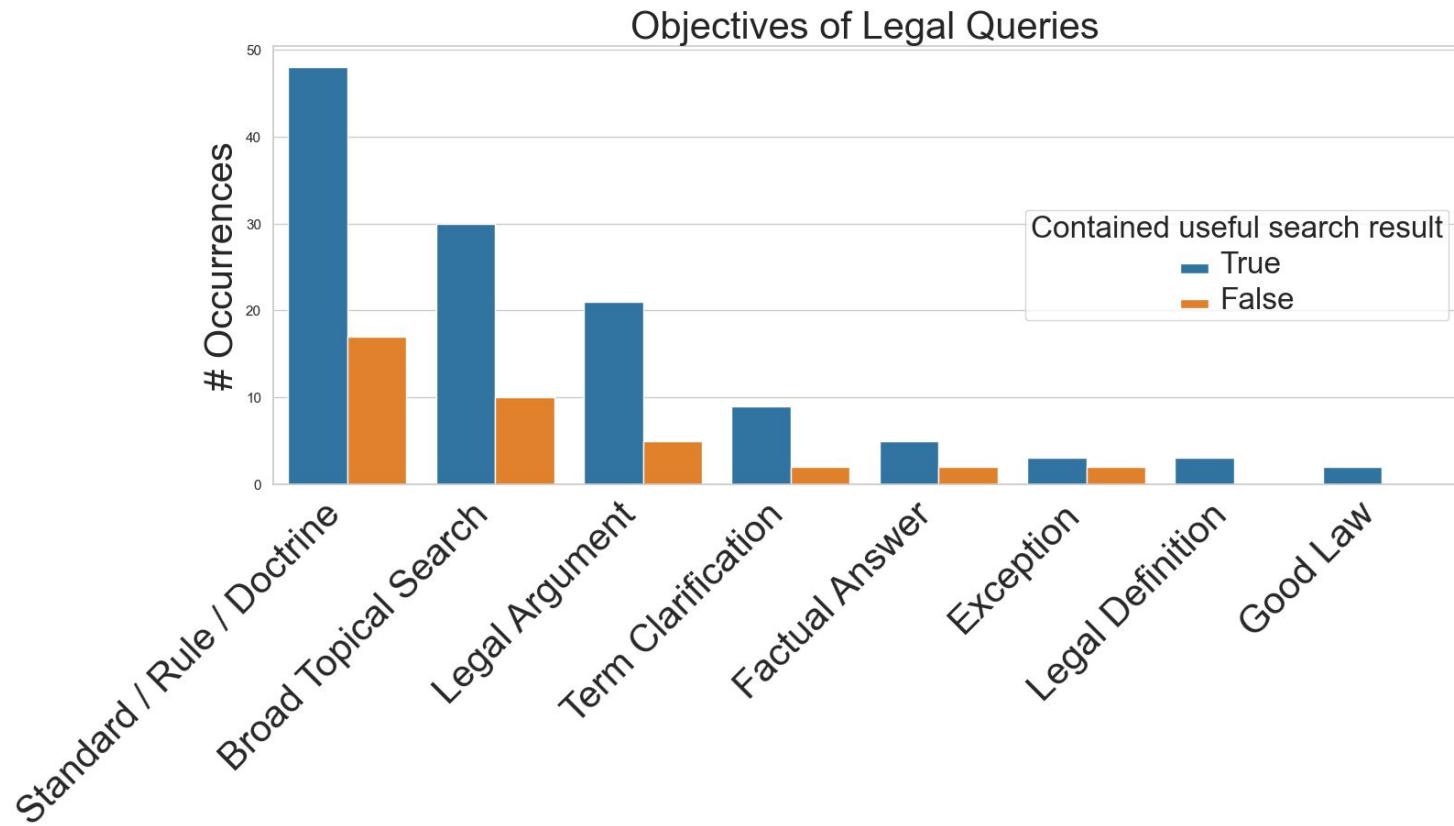
# Contributions

- Introduce NLP Task: legal retrieval for public defenders
- Release matching dataset:
  - Same queries
  - Corpus: public briefs and directives
  - Annotated by authors
- NLP experiments (baselines)

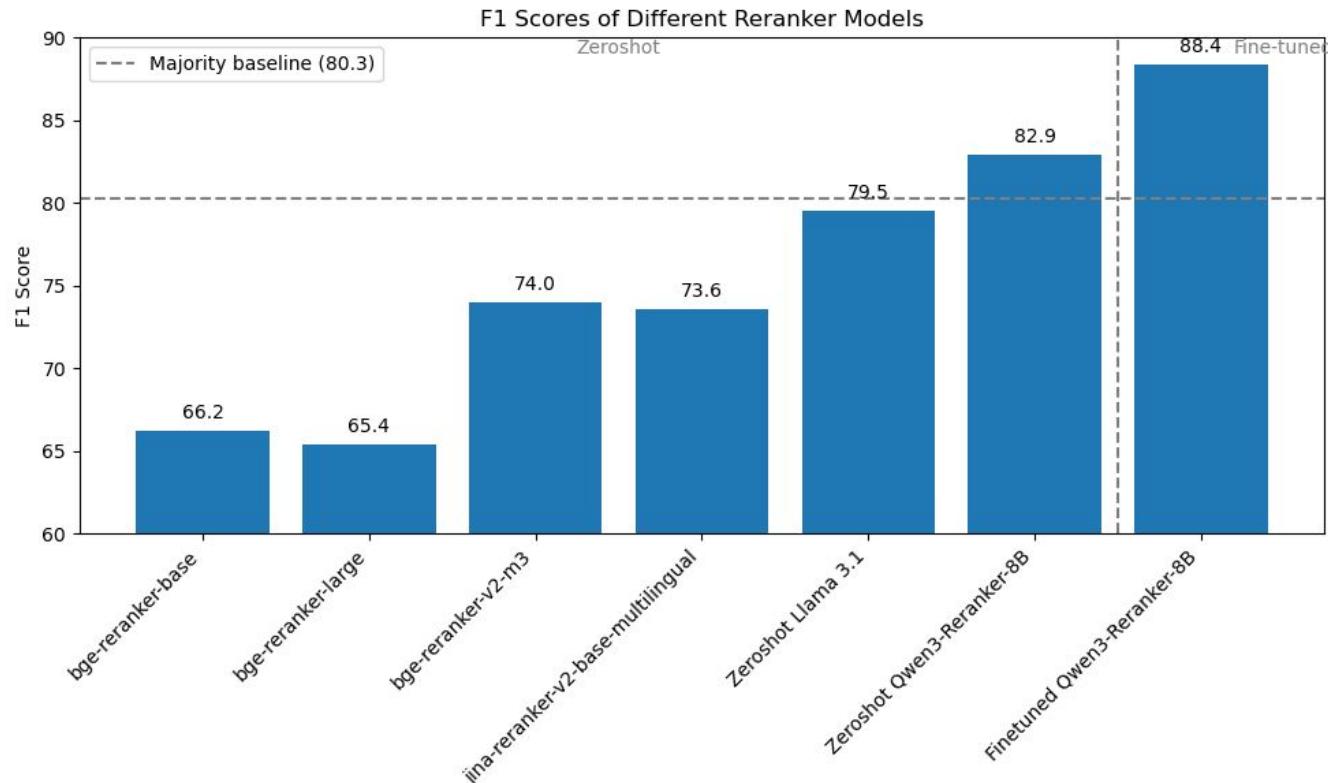
# Public Defense Queries

- **Rules:** “803(c)(27)”
- **Broad topical searches:** “find briefs about community caretaking”
- **Legal arguments:** “What are arguments against consent searches during illegal car stops?”

# Search Objectives

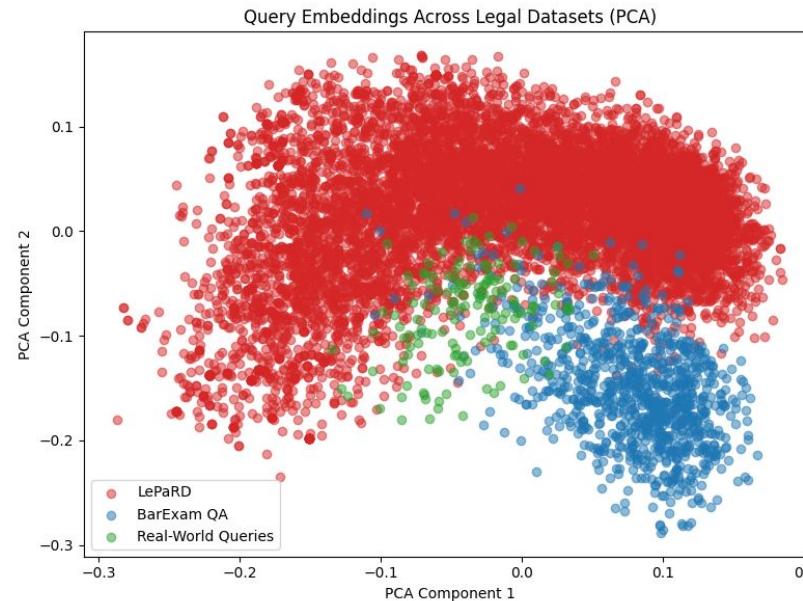


# Off-the-shelf Rerankers perform poorly



# Mismatch Academic Benchmarks and Realistic Queries

- Public Defense Query: “803(c)(27)”
- LePaRD Query: The final element of the “commercial activity” exception poses the issue remaining on this remand, namely in light of Weltover, did the detention of the aircraft cause



# Training on Existing Legal Benchmarks

	Rc&5: LePaRD	Rc&5: Public Defense Queries
Zero-shot e5-large-v2	17.6	<b>33.7</b>
e5-large fine-tuned on LePaRD	<b>38.2</b> (+ 20.6)	22.2 (-11.5)

# Synthetic Data

- System prompt: “Draft a public defense query for which the following paragraph is a good search result”  
→ query: “*Do plaintiffs in ERISA cases involving defined contribution plans have standing to sue for breach of fiduciary duty claims under Section 502(a)(2)?*”
  - Carefully curated synthetic data
    - Fine-tune Llama-70B to generate realistic queries
    - Filter with Llama-70B zero-shot (drop procedural or fact paragraphs)
    - Filter queries / paragraphs with Legal Reranker
- query: “*waiver of rights by defendant with limited English proficiency*”

# Training on Synthetic Data

	Rc&5: Public Defense Queries
zero-shot e5-large-v2	33.7
e5-large-v2 fine-tuned on naive synthetic data	32.0 (-1.7)
e5-large-v2 fine-tuned on curated synthetic data	<b>37.8 (+4.1)</b>

# Legal Domain Adaptation

- Further pre-trained ModernBERT on all US court opinions (CourtListener)

method	Rc&5: Public Defense Queries
ModernBERT fine-tuned on synthetic naive	15.4
LegalModernBERT fine-tuned on naive synthetic data	17.4 (+2.0)
ModernBERT fine-tuned on curated synthetic data	26.2
LegalModernBERT fine-tuned on curated synthetic data	<b>27.1 (+0.9)</b>

# How to Improve Recall?

- (1) Bigger models
  - all-mpnet: 20.4 Recall@5
  - Qwen3-Embedding-8B: 35.9% Recall@5
- (2) Carefully optimized synthetic data
- (3) Legal domain adaptation

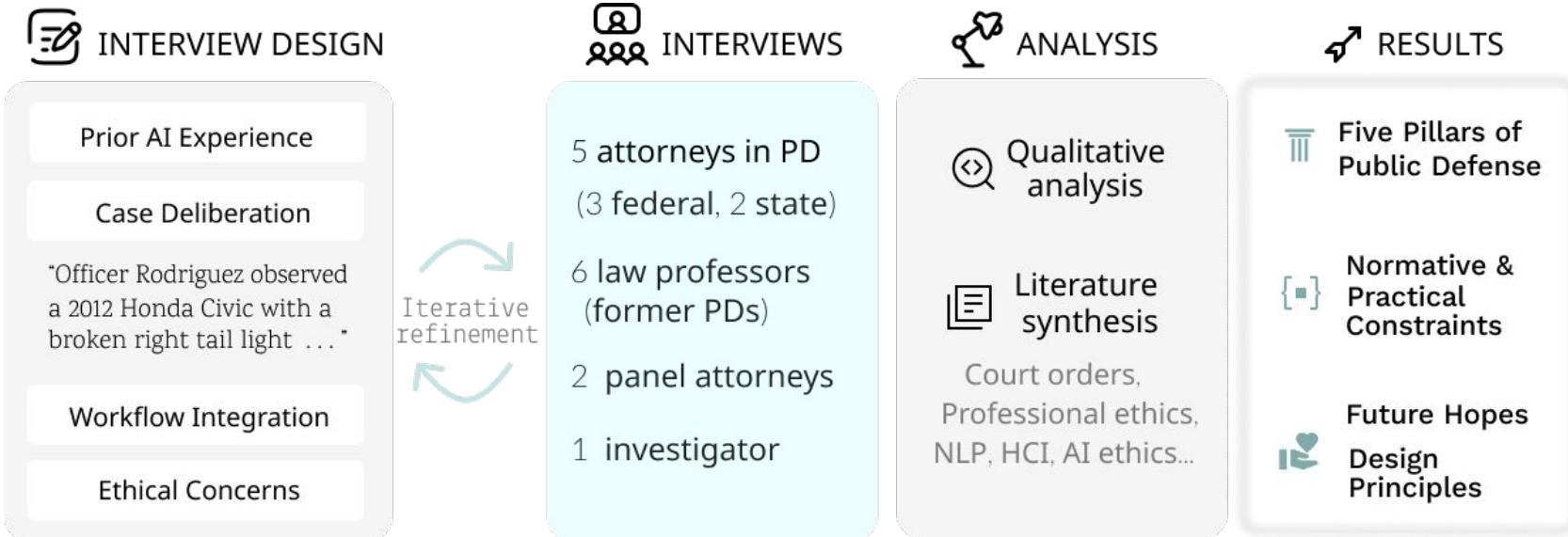
→ lots of room for improvement

# **How Can AI Augment Access to Justice? Public Defenders' Perspectives on AI Adoption**

**Inyoung Cheong<sup>\*,†</sup>, Patty Liu<sup>\*</sup>, Dominik Stammbach<sup>\*</sup>, Peter Henderson**  
Princeton University

**Public defenders are asked to do more with less: representing clients deserving of adequate counsel while facing overwhelming caseloads and scarce resources. While artificial intelligence (AI)**

# Methodology



# Barriers

*Public defenders feel hesitant to use AI because...*

## Costs

*"I cannot justify its price tag."*  
(n=2)

## Office Policies

*"My office doesn't allow AI use for work."*  
(n=3)

## Confidentiality

*"Without 100% confidentiality, I would never put my client's info into AI."*  
(n=8)

## Output Quality

*"AIs fail to capture subtle differences between cases."* (n=6)

*"The possibility of hallucinations is a serious concern to me."* (n=4)

*"Outputs can be incomplete, representing a biased picture of information."* (n=3)

# Five Pillars of Public Defense Work

- Client Communication
- Evidence Investigation
- Defense Strategy
- Legal Research and Writing
- Courtroom Representation

# AI Opportunities: Evidence Investigation

## **Evidence Investigation**

Transcribe Audio and Video (71%)

Generate summaries (documents, videos, recordings) (71%)

De-duplicate data points (35%)

# AI Opportunities: Legal Research and Writing

## **Legal Research and Writing**

Generate summaries (57%)

Starting points for new topics (50%)

	Evidence Investigation	Legal Research & Writing	Courtroom Representation	Client Communication	Defense Strategies
AI Can Help	Transcribe audio and video recording (n=10)	Generate summaries and surveys of information (n=8)	Propose cross examination questions (n=3)	Reword messages for clarity and to suit client's level of education or prior legal knowledge (n=3)	Brainstorm possible challenges for each strategies (n=2)
AI Cannot Help	Generate summaries of documents and recordings (n=10)	Provide starting points to learn a new topic (n=7)	Pull up references in real time (n=3)	Summarize witness testimony and point out inconsistencies (n=2)	Draft opening and closing statements (n=2)
	Understand the contextual patterns in video footage (n=2)	Verify research outputs (n=12)	Navigate personal characteristics of judges, prosecutors, and juries (n=4)	Build trust and rapport with clients through empathy and listening (n=7)	Navigate personal characteristics of judges, prosecutors, and juries (n=4)
				Interpreting the preferred strategies of clients (n=3)	

# NLP & AI Tasks

<b>Problem</b>	<b>Public Defender Need</b>	<b>Example</b>	<b>Related AI Research</b>
Large Volumes of Data	finding “ <i>needles in the haystack</i> ”	body worn camera footage	Span extraction, summarization, transcription, deduplication
Legal Research and Writing	Legal search, drafting documents, summarize cases	NJ BriefBank	Legal retrieval, summarization, generate information survey

# Public Defenders' Perspective

- AI to assist in monotonous and time-consuming tasks
- Empowers defenders and makes time for legal representation
- Human element in public defense:
  - *“a good public defender does a lot of social work, [such as] getting their client into the drug program [...]”*

# Insights and Takeaways

# AI for Legal Research and Writing

## Legal Research & Writing

Generate summaries and surveys of information (n=8)

Provide starting points to learn a new topic (n=7)

Draft or edit of legal documents (n=3)

Narrow down case searches (n=2)

## Why BriefBank?

- Current Office practice
- Reuse existing materials
  - Overview legal landscape
  - Legal arguments
  - Applicable precedent, standards, rules
- From office perspective: defenders make more consistent arguments

# Barriers for Generative AI

- High stakes and low error tolerance
- NJ OPD evaluated genAI for answering legal queries
  - Closed-source RAG application
- 66% of queries not handled well

## Output Quality

*"AIs fail to capture subtle differences between cases." (n=6)*

*"The possibility of hallucinations is a serious concern to me." (n=4)*

*"Outputs can be incomplete, representing a biased picture of information." (n=3)*

# Caselaw Search

- We discussed (and implemented) finding relevant case law
- Only limited practical value
  - Problem: overturned precedent



## Semantic Search API Now Live!

**Rachel Gao**

November 5, 2025

Announcing the launch of our Semantic Search API in CourtListener—a major leap forward in how you search legal data.

# Data Confidentiality

- Currently deploying tool as webapp
- Help from NJ OIT regarding security / confidentiality

## Confidentiality

*"Without 100% confidentiality,  
I would never put my  
client's info into AI."*

(n=8)

# Office Policies

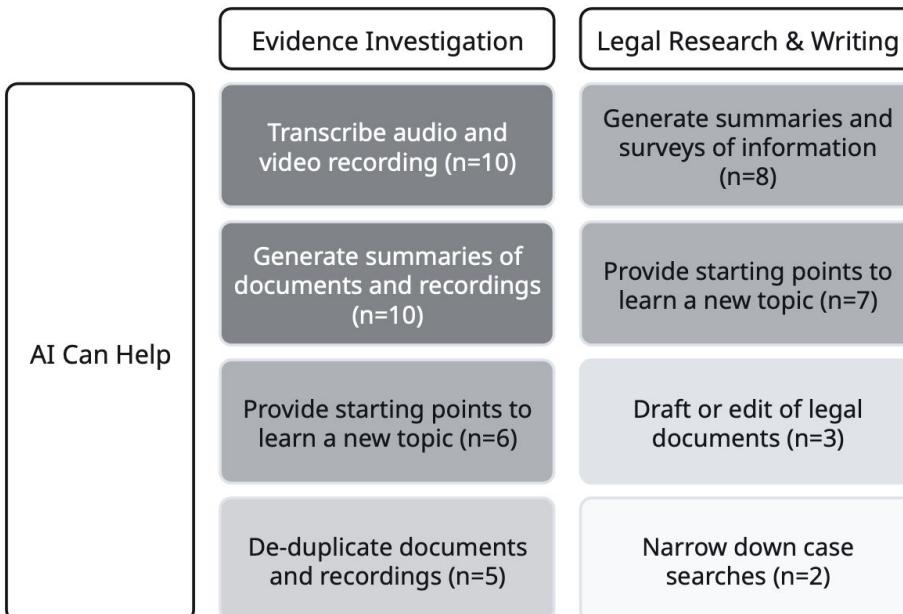
- NJ OPD works on AI policies
- And AI training

## Office Policies

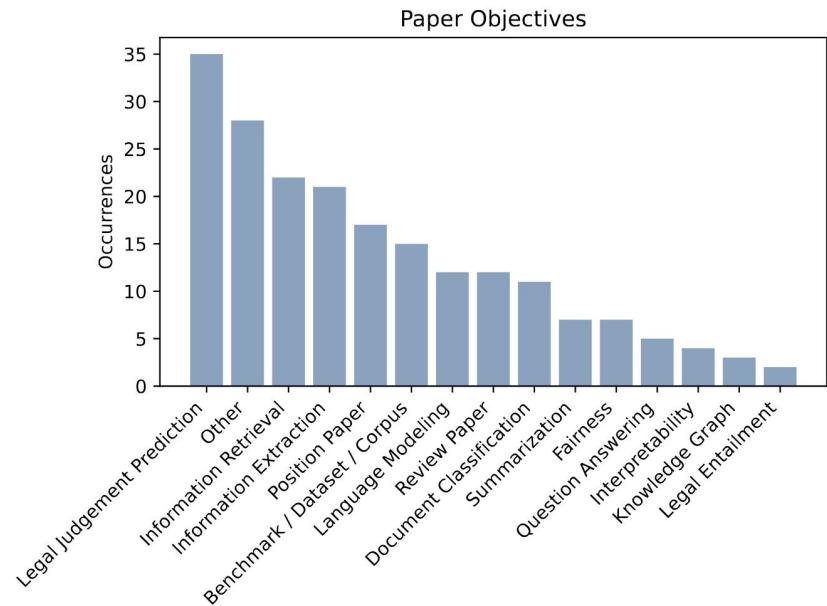
*"My office doesn't allow AI use for work."*

(n=3)

# Practical AI Tasks for Public Defense



Public defense tasks identified in  
(Cheong et al., 2025)



Overview legal NLP objectives in  
(Mahari et al., 2023)

# Recommendations

- We need more
  - research on practical AI tasks for public defenders
  - datasets to make progress on methods
  - realistic tasks and benchmarks
- Hopefully provided some starting points
- *“Clients have a right to counsel, not to machines”*

# Summary and Conclusion

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