

# 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)
- However, 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

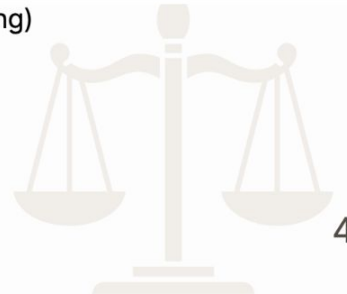
## Oregon public defenders warn of ongoing crisis as defendants remain without representation



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

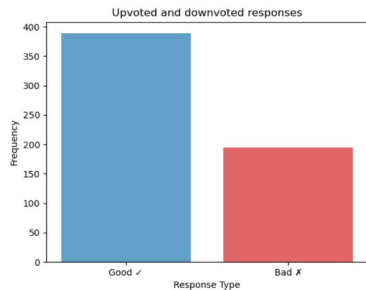
► Expand to read an AI summary of the brief



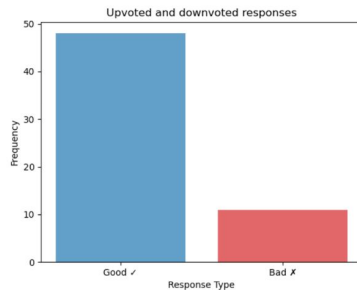


# System Overview

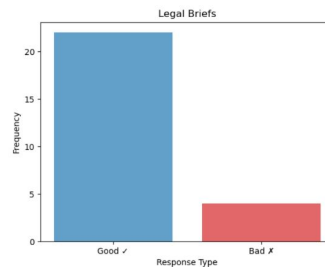
- Preprocessing
- Inference
  - Qwen3-8B-Embeddings and bm25
  - Fine-tuned Qwen3-8B-Reranker
  - Recency reranking
  - Display results
- Iterative development and evaluation rounds



First round (February)



Second round (April)



Third round (June)

# AI Applications in Government Agencies

## Agencies prioritize information accessibility

- 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 Stammach<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

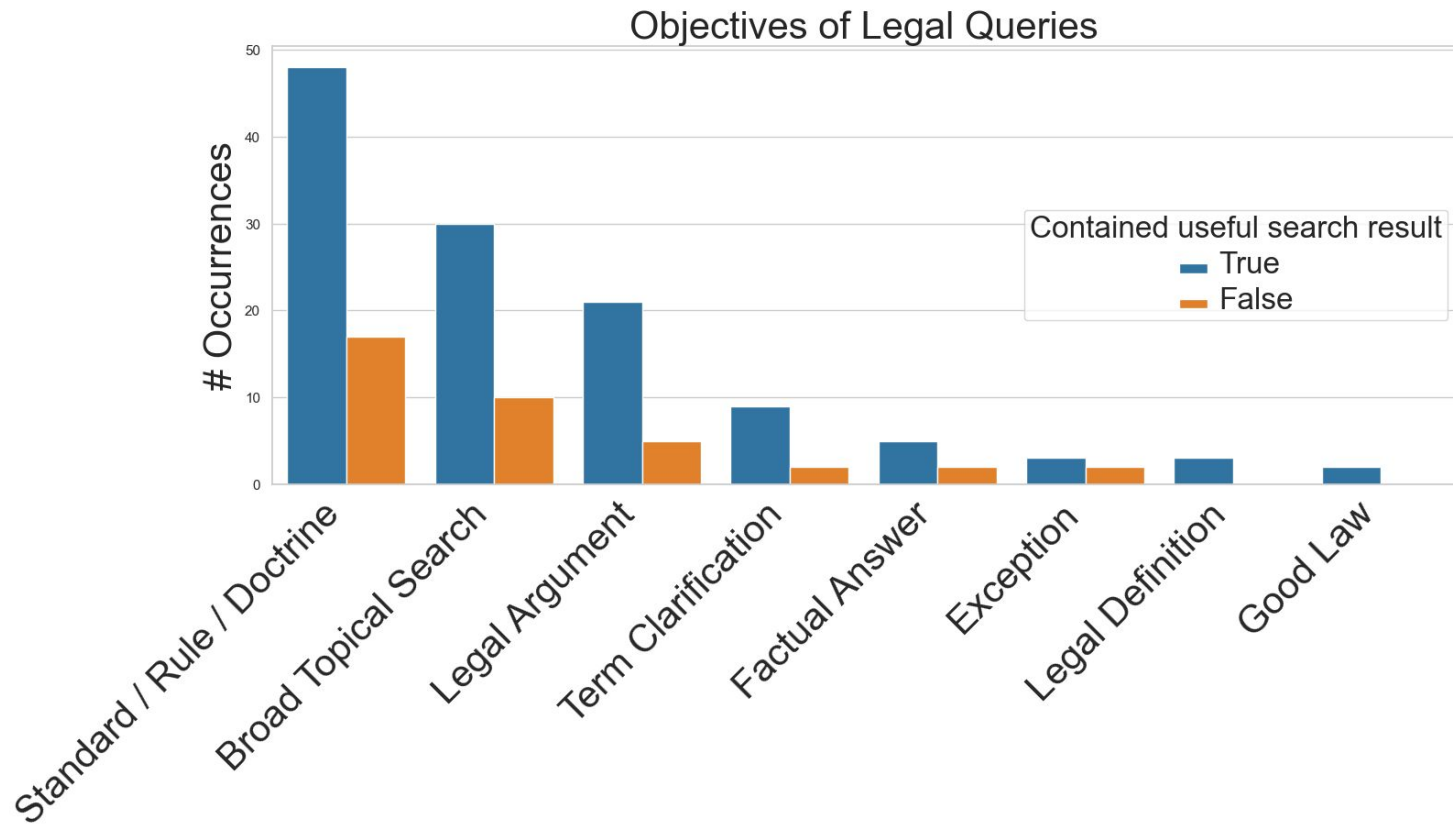
# Contributions

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

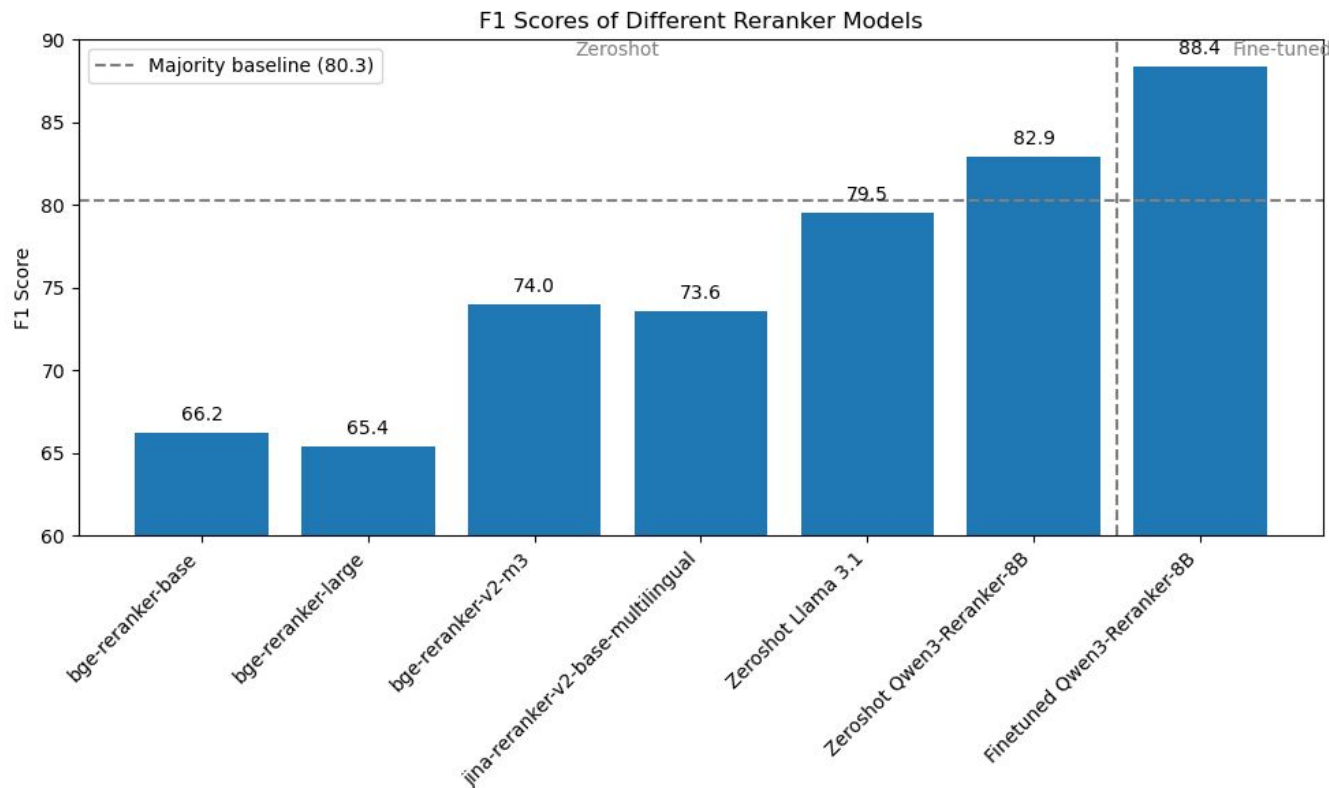
# Public Defense Queries

- **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

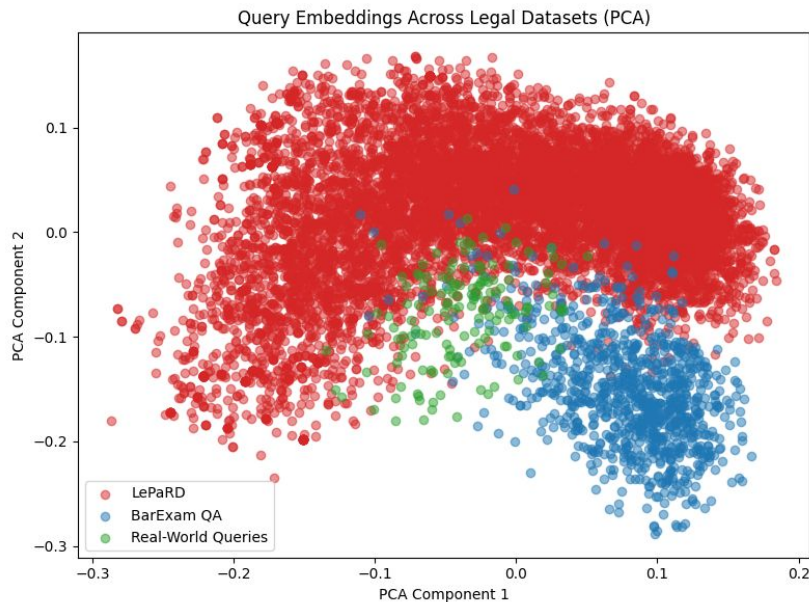


# Off-the-shelf Rerankers perform poorly



# 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”

→ *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 zeroshot (drop procedural or fact paragraphs)
  - Filter queries / paragraphs with Legal Reranker

→ *waiver of rights by defendant with limited English proficiency*

# Training on Existing Legal Benchmarks

	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</b> (+0.9)

# How to Improve Recall?

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

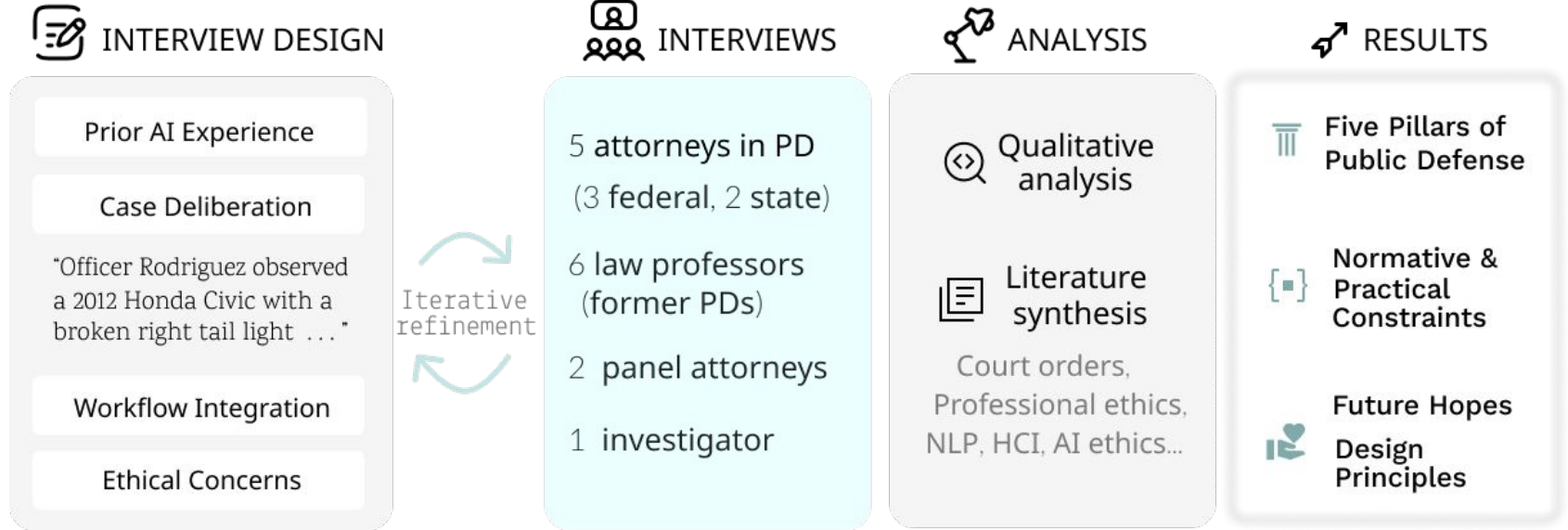
→ lots of room for improvement

# 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)*



# Categories of Public Defense Work

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

# AI Opportunities: Evidence Investigation

<b>Evidence Investigation</b>
Transcribe Audio and Video (71%)
Generate summaries (documents, videos, recordings) (71%)
De-duplicate data points (35%)

# AI Opportunities: Legal Research and Writing

<b>Legal Research and Writing</b>
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)
	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)		
	Provide starting points to learn a new topic (n=6)	Draft or edit of legal documents (n=3)	Summarize witness testimony and point out inconsistencies (n=2)		
	De-duplicate documents and recordings (n=5)	Narrow down case searches (n=2)	Draft opening and closing statements (n=2)		
AI Cannot Help	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

Problem	Public Defender Need	Example	Related AI Research
Large Volumes of Data	finding “ <i>needles in the haystack</i> ”	100 hours of body worn camera footage	Span extraction, summarization, transcription, deduplication
Legal Research and Writing	Legal search, drafting documents, make legalese accessible	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”*
  - *“Clients have a right to counsel, not to machines”*

# 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)*

# 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

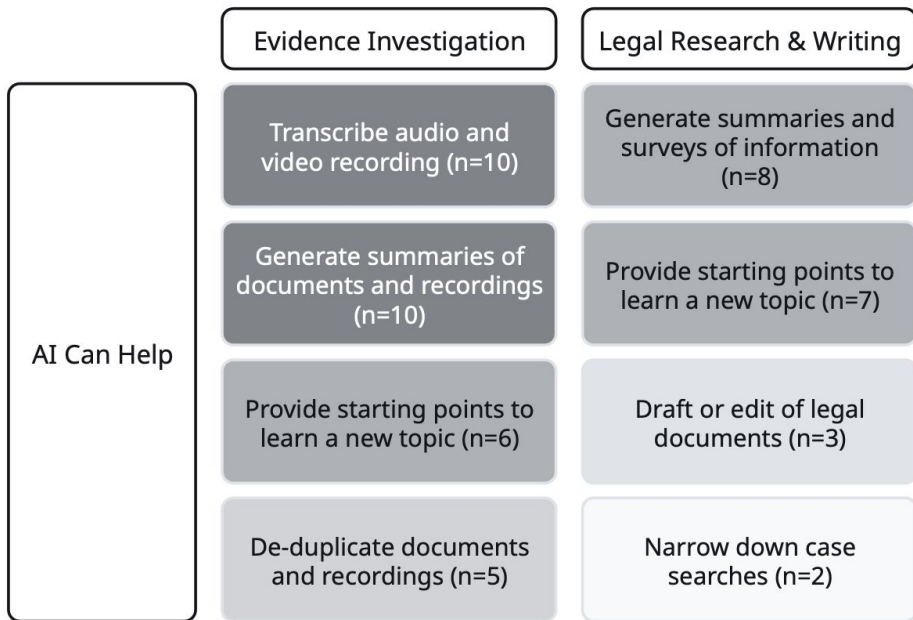
- NJ OPD works on AI policies
- And AI training

## **Office Policies**

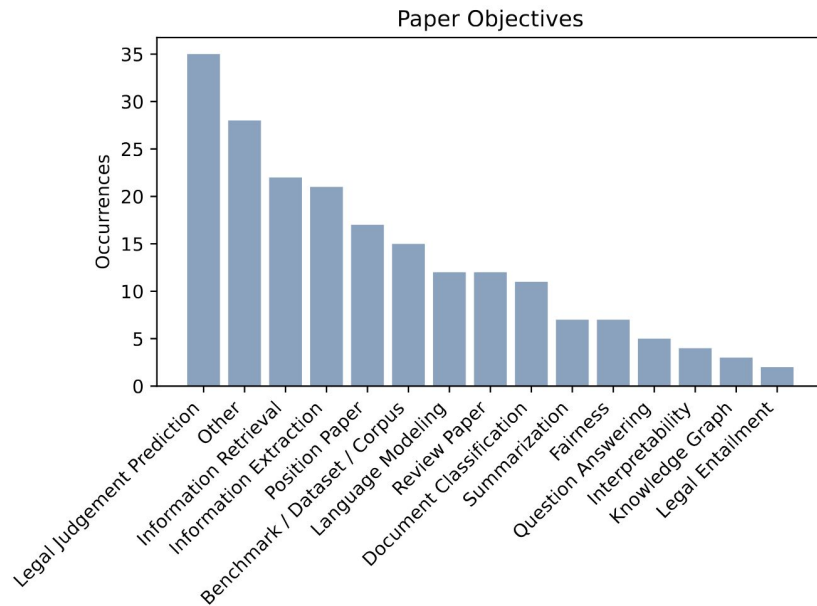
*"My office doesn't  
allow AI use for work."*

(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 legal NLP tasks and datasets
- Hopefully provided some starting points

# Summary and Conclusion

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