



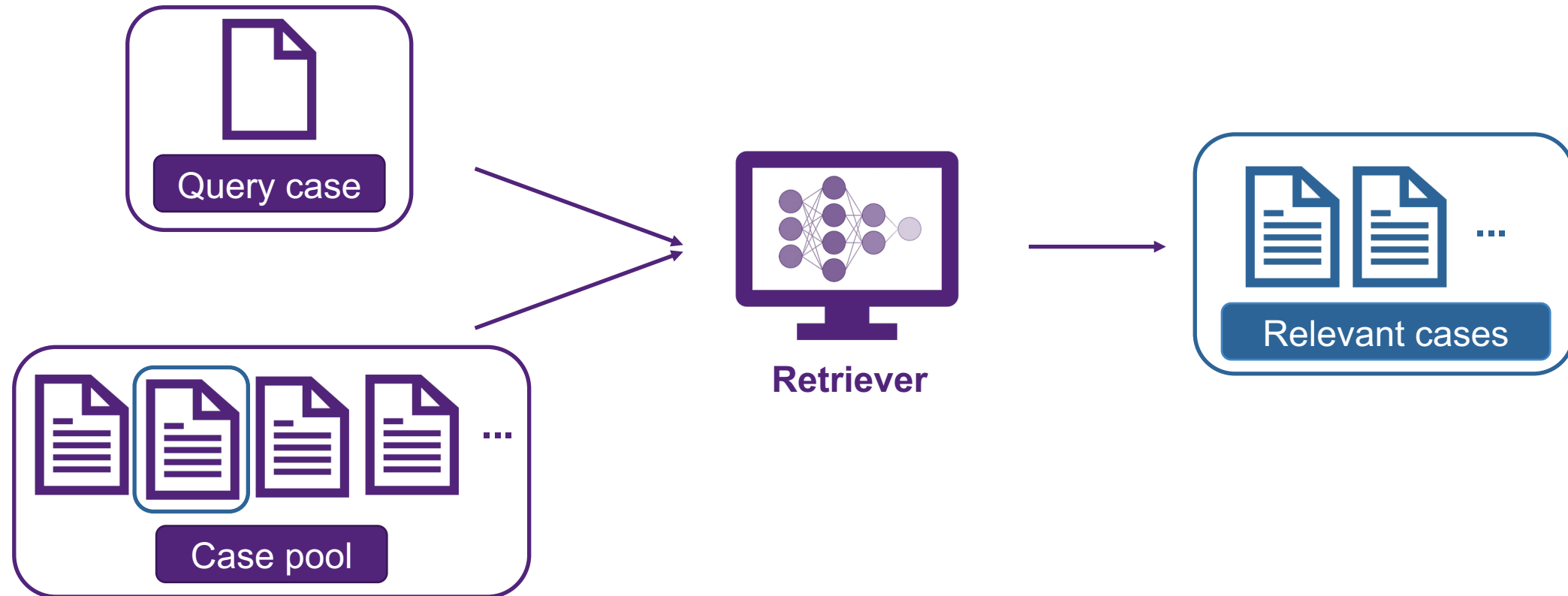
Code Link

CaseGNN: Graph Neural Networks for Legal Case Retrieval with Text-Attributed Graphs

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Legal Case Retrieval Workflow



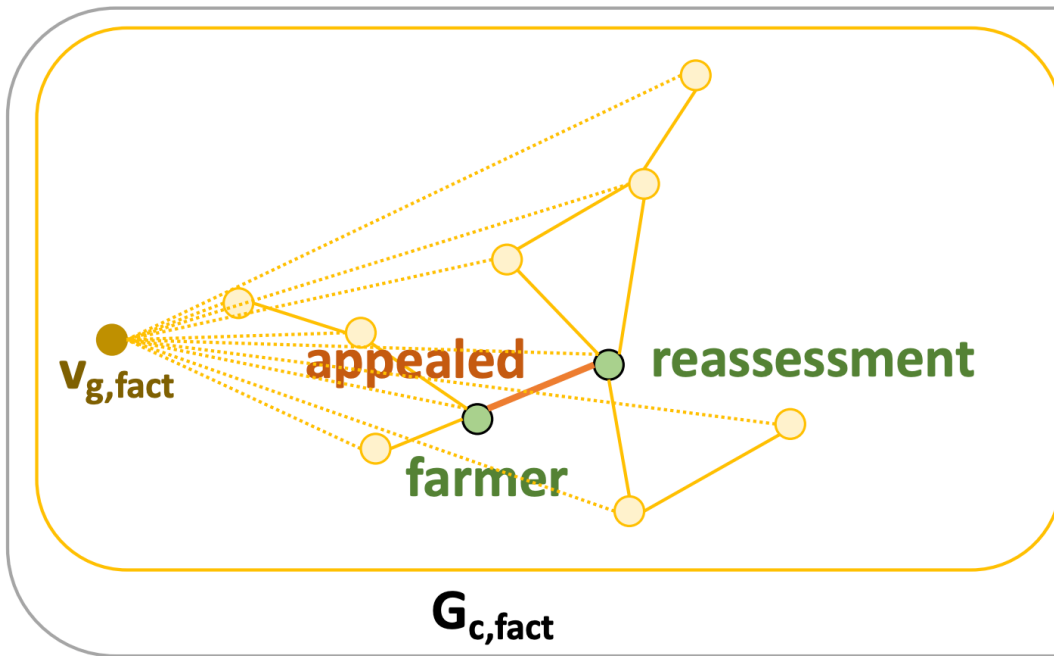
Challenges

- Legal **structural** information:
 - High-order interactions of **elements** in a case: parties, crime activities and evidences of cases
- **Lengthy** legal text limitation:

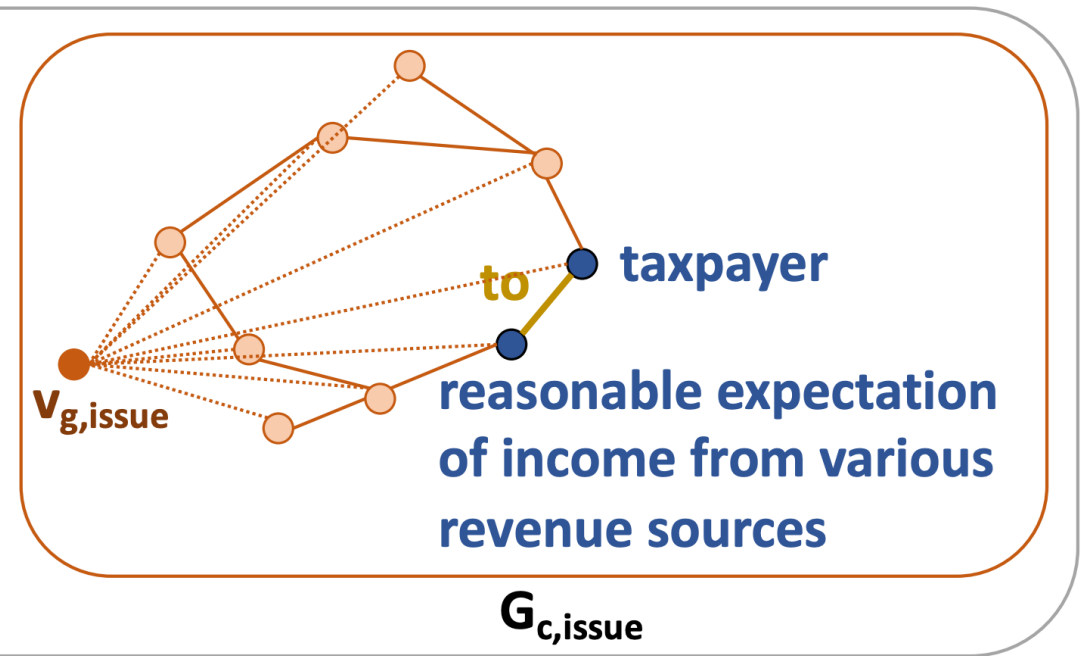
Datasets	LeCaRD COLIEE2023	
Language	Chinese	English
Avg. length/case	8,275	5,566
Largest length of cases	99,163	61,965
Avg. relevant cases/query	10.33	2.69

TACG

Transform a legal case into a Text-Attributed Case Graph (TACG).

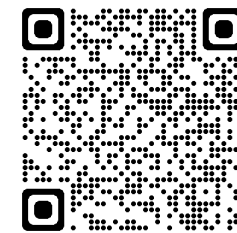


Legal fact: ...a **farmer** **appealed** the **reassessment** of his losses to ...

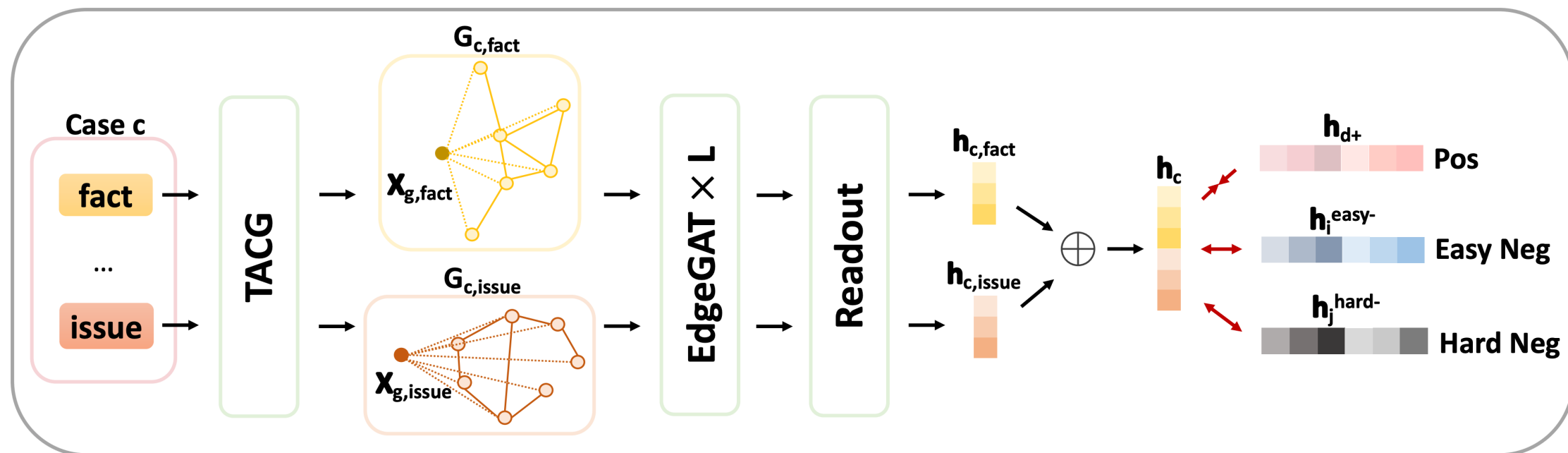


Legal issue: ... "reasonable expectation of income from various revenue sources" **to** taxpayer is ...

CaseGNN Framework



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Overall Performance

Methods	COLIEE2022							COLIEE2023						
	P@5	R@5	Mi-F1	Ma-F1	MRR@5	MAP	NDCG@5	P@5	R@5	Mi-F1	Ma-F1	MRR@5	MAP	NDCG@5
One-stage														
BM25	<u>17.9</u>	<u>21.2</u>	<u>19.4</u>	<u>21.4</u>	23.6	25.4	33.6	<u>16.5</u>	<u>30.6</u>	<u>21.4</u>	<u>22.2</u>	23.1	20.4	23.7
LEGAL-BERT	4.47	5.30	4.85	5.38	7.42	7.47	10.9	4.64	8.61	6.03	6.03	11.4	11.3	13.6
MonoT5	0.71	0.65	0.60	0.79	1.39	1.41	1.73	0.38	0.70	0.49	0.47	1.17	1.33	0.61
SAILER	16.6	15.2	14.0	16.8	17.2	18.5	25.1	12.8	23.7	16.6	17.0	25.9	25.3	29.3
PromptCase	17.1	20.3	18.5	20.5	<u>35.1</u>	<u>33.9</u>	<u>38.7</u>	16.0	29.7	20.8	21.5	<u>32.7</u>	<u>32.0</u>	<u>36.2</u>
CaseGNN (Ours)	35.5±0.2	42.1±0.2	38.4±0.3	42.4±0.1	66.8±0.8	64.4±0.9	69.3±0.8	17.7±0.7	32.8±0.7	23.0±0.5	23.6±0.5	38.9±1.1	37.7±0.8	42.8±0.7
Two-stage														
SAILER	23.8	<u>25.7</u>	<u>24.7</u>	25.2	<u>43.9</u>	<u>42.7</u>	<u>48.4</u>	19.6	32.6	24.5	23.5	37.3	36.1	40.8
PromptCase	23.5	25.3	24.4	30.3	41.2	39.6	45.1	21.8	<u>36.3</u>	27.2	<u>26.5</u>	<u>39.9</u>	<u>38.7</u>	<u>44.0</u>
CaseGNN (Ours)	22.9±0.1	27.2±0.1	24.9±0.1	27.0±0.1	54.9±0.4	54.0±0.5	57.3±0.6	20.2±0.2	37.6±0.5	26.3±0.3	27.3±0.2	45.8±0.9	44.4±0.8	49.6±0.8

- CaseGNN performs the best.
- Case graphs help avoid lengthy case text and preserve legal context.



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Thank you!

Q & A