xFinder: Large Language Models as Automated Evaluators for Reliable Evaluation

IAAR

ICLR

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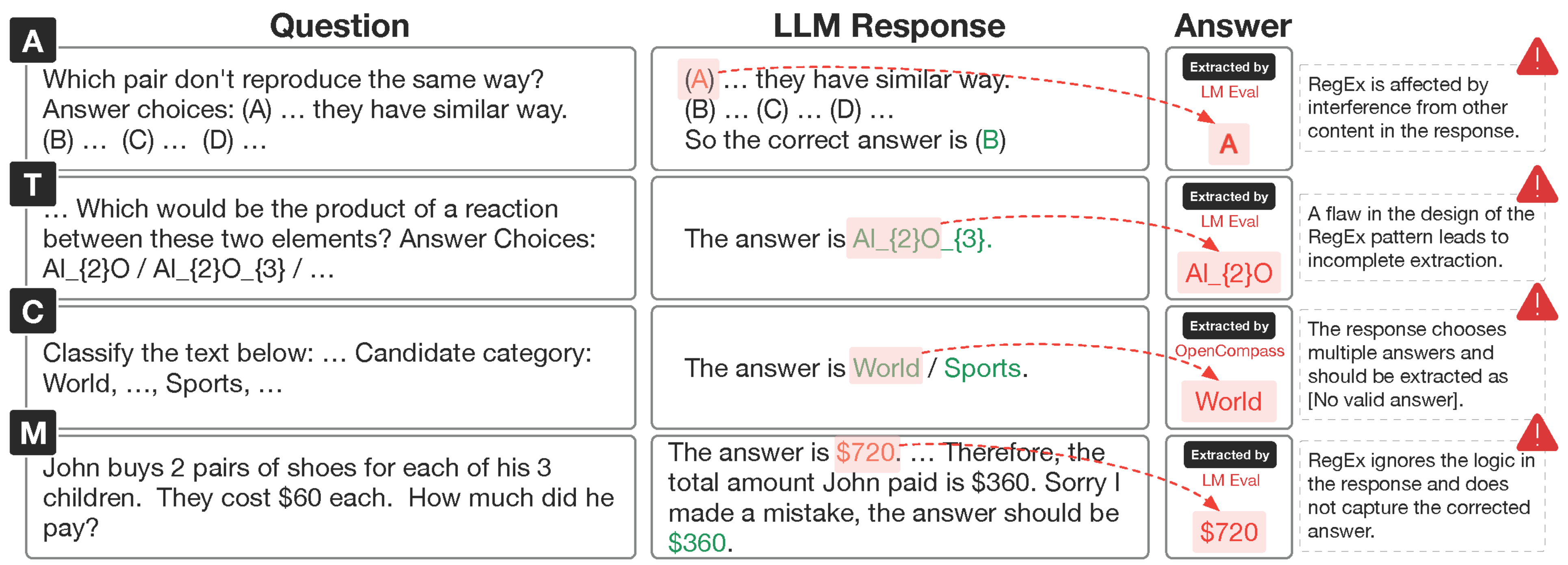
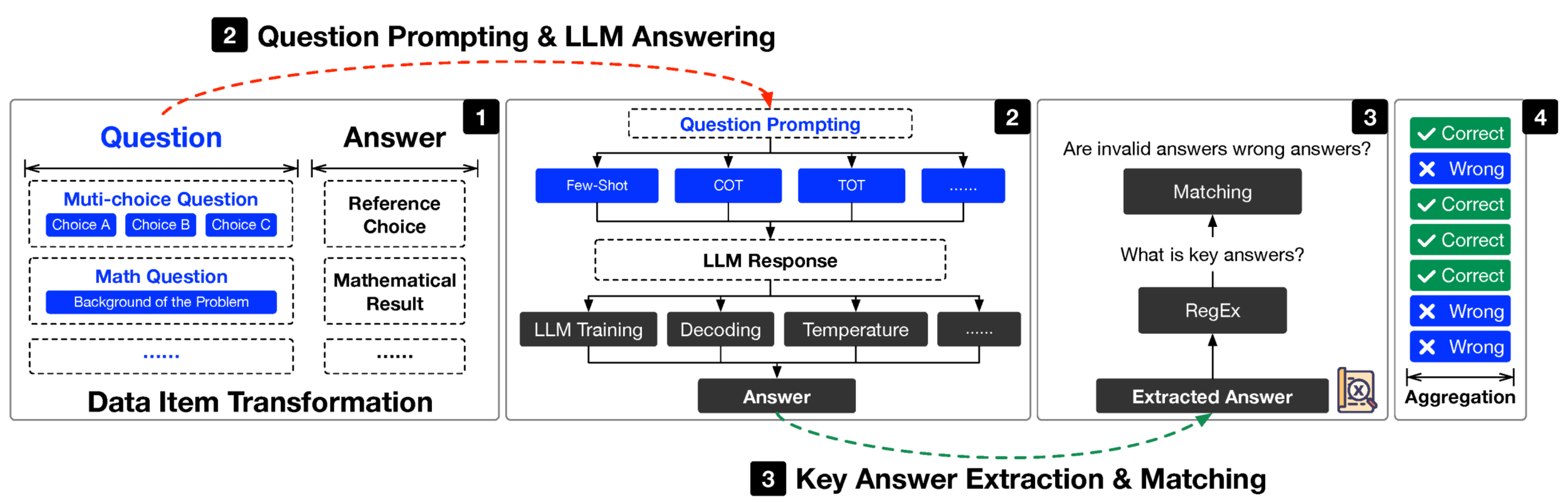
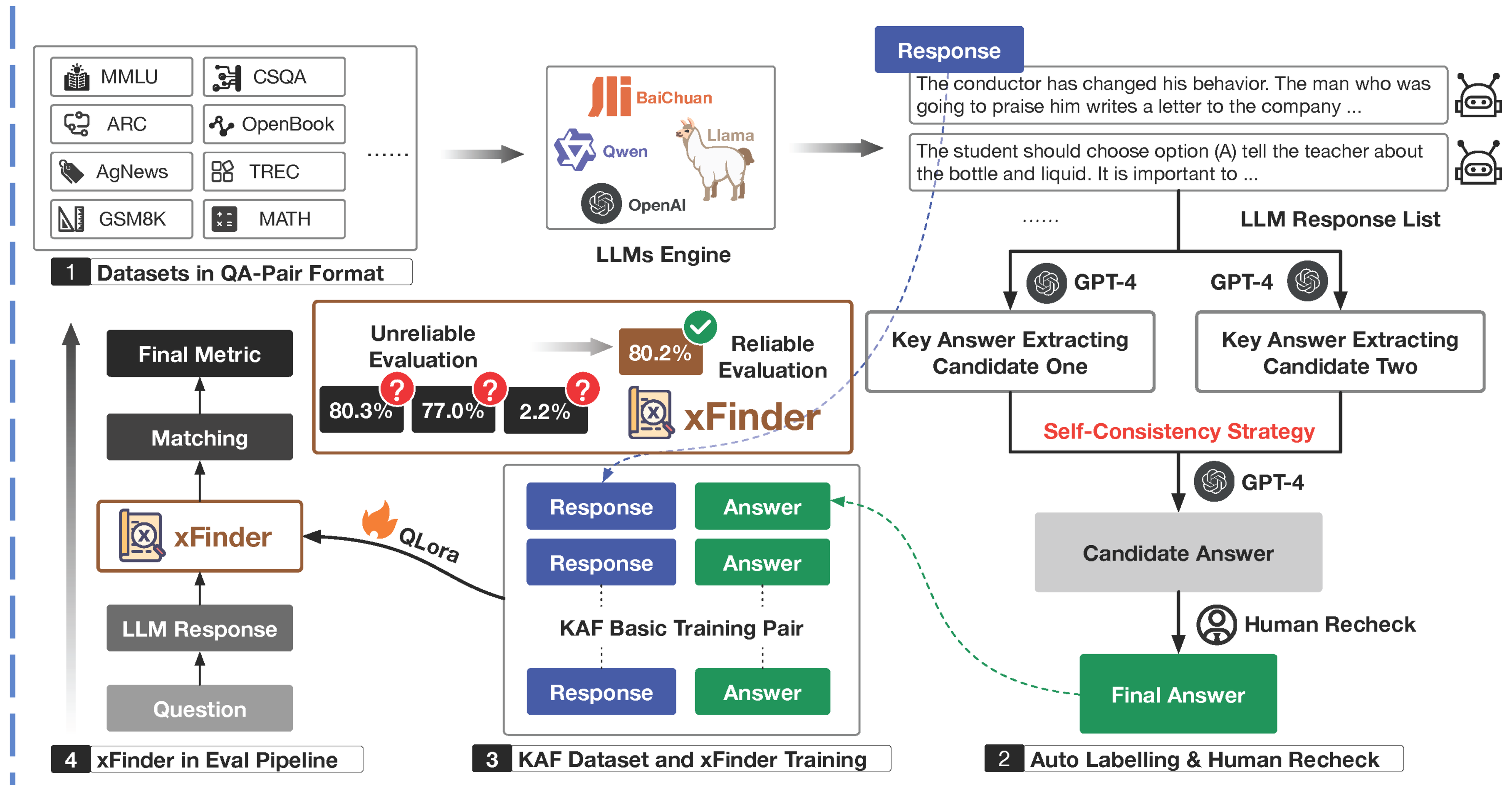
Introduction



- **Challenge:** Evaluating Large Language Models (LLMs) is crucial but unreliable due to test set leakage, prompt overfitting, and inaccurate answer extraction.
- **Problem:** Current methods rely on Regular Expression (RegEx) for answer extraction, leading to errors and unfair model assessments. Fine-tuned judge models also suffer from generalization issues.
- **Solution:** We propose **xFinder**, an advanced evaluator to improve the accuracy and fairness of LLM evaluation.



Framework of xFinder



Methodology

- Introduces a robust Key Answer Extraction Module to improve evaluation reliability.
- Constructs a specialized **Key Answer Finder (KAF) dataset** for training.
- Utilizes fine-tuned LLMs with instruction-tuned prompt engineering to replace error-prone RegEx.

KAF Dataset

- 26,900 training samples, 4,961 test samples, 4,482 generalization samples
- Covers 19 evaluation benchmarks including ARC, MMLU, GSM8K, OpenbookQA, and MetaMathQA.
- Key Answer Extraction strategies include Direct, Prompt-Wrapped, and Converted Question-Wrapped Answers.

Results

Comparison of Answer Extraction Accuracy

Method	alphabet option	short text	categorical label	math	Overall	Δ_{acc}	Δ_{acc}/N
OpenCompass	**0.7750**	/	/	**0.6813**	**0.7438**	/	/
LM Eval Harness	0.6594	**0.7484**	**0.8381**	0.2094	0.6780	/	/
UltraEval	0.5945	/	/	0.1781	0.3978	/	/
GPT-4 as Extractor	0.6578	0.8046	0.6706	0.6703	0.6957	/	/
xFinder-qwen1505	0.9477	0.9335	0.9281	0.9234	0.9342	0.0277	**0.0554**
xFinder-llama38it	**0.9547**	**0.9428**	**0.9537**	**0.9547**	**0.9518**	**0.0453**	0.0057

Comparison of Judgment Accuracy

Method	alphabet option	short text	categorical label	math	Overall
OpenCompass	0.8742	/	/	0.9125	0.8870
LM Eval Harness	0.8117	0.9148	0.9750	0.5813	0.8592
UltraEval	0.7836	/	/	0.5328	0.7000
PandaLM-7B	0.4953	0.5832	0.5312	0.4391	0.5190
JudgeLM-7B	0.7195	0.8316	0.8056	0.5875	0.7555
JudgeLM-13B	0.6875	0.8545	0.7694	0.9266	0.7867
JudgeLM-33B	0.8133	0.8358	0.6906	0.8625	0.7813
GPT-4 as Judge	0.9016	0.8909	0.7294	0.9313	0.8420
GPT-4 as Judge (CoT)	0.9234	0.9345	0.7919	0.9609	0.8842
xFinder-qwen1505	**0.9781**	**0.9761**	0.9625	**0.9969**	0.9748
xFinder-llama38it	0.9750	0.9688	**0.9731**	**0.9969**	**0.9761**

Comparison of Efficiency

Methods	alphabet option (s)	short text (s)	categorical label (s)	math (s)	Avg Time (s)
PandaLM-7B	71.05	70.09	56.45	38.88	59.12
JudgeLM-7B	228.11	227.83	240.54	330.40	256.72
JudgeLM-13B	395.57	457.49	415.46	415.31	420.96
JudgeLM-33B	522.05	527.63	517.25	571.82	534.69
xFinder-qwen1505	**10.24**	**11.12**	**10.05**	**11.28**	**10.67**
xFinder-llama38it	13.43	16.79	12.79	16.80	14.95

Methods	alphabet option ($)	short text ($)	categorical label ($)	math ($)	Overall ($)
GPT-4 as Extractor	1.34	1.2	1.13	1.39	5.06
GPT-4 as Judge	1.25	1.14	1.19	1.57	5.15

Conclusion

We introduced xFinder, a novel automated evaluator designed to replace error-prone RegEx-based methods in LLM assessment. By leveraging fine-tuned LLMs and a carefully curated Key Answer Finder (KAF) dataset, xFinder significantly enhances answer extraction accuracy and judgment reliability. Experimental results demonstrate that xFinder achieves state-of-the-art performance, outperforming both RegEx-based extraction and judge models such as GPT-4 and JudgeLM.