ArxivDIGESTables: Synthesizing Scientific Literature into Tables using Language Models

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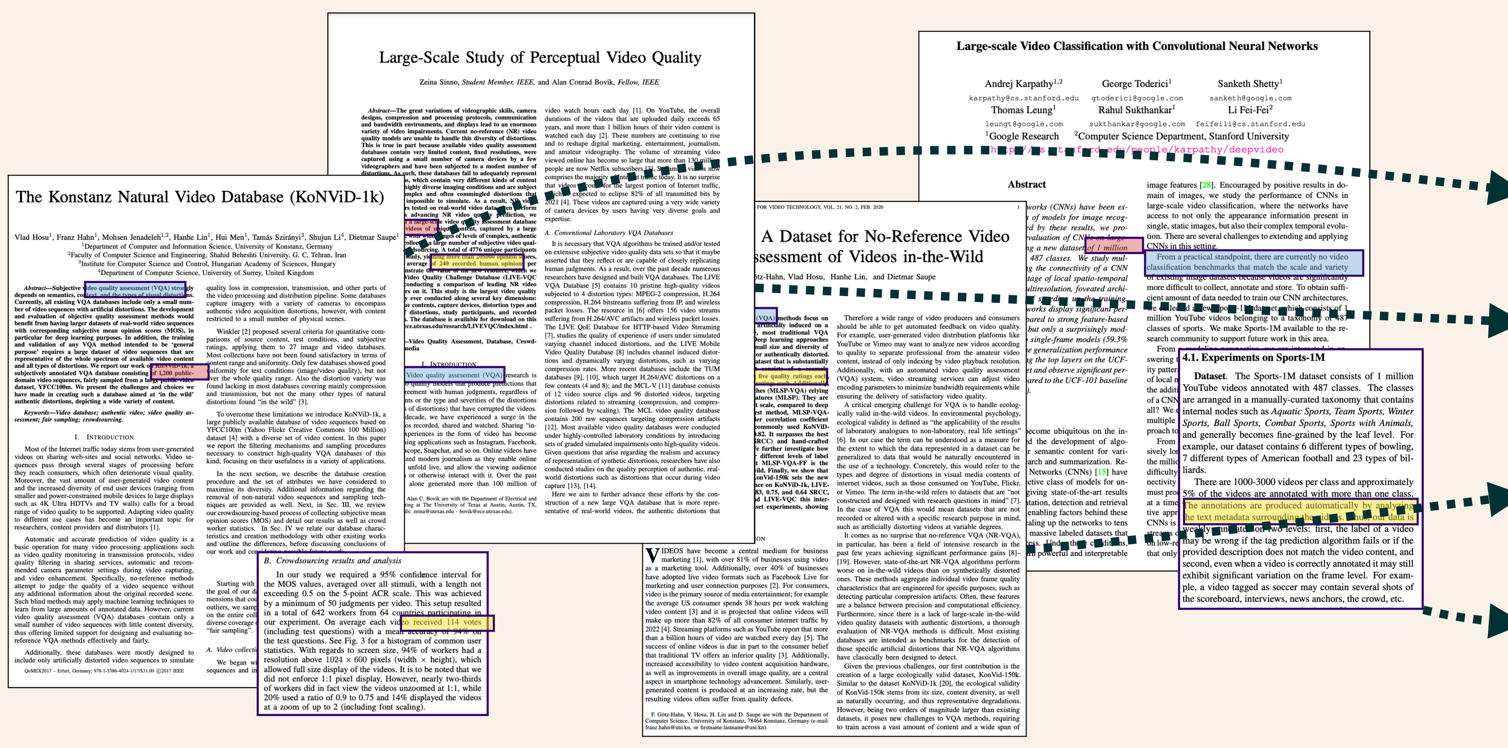
Motivating Example

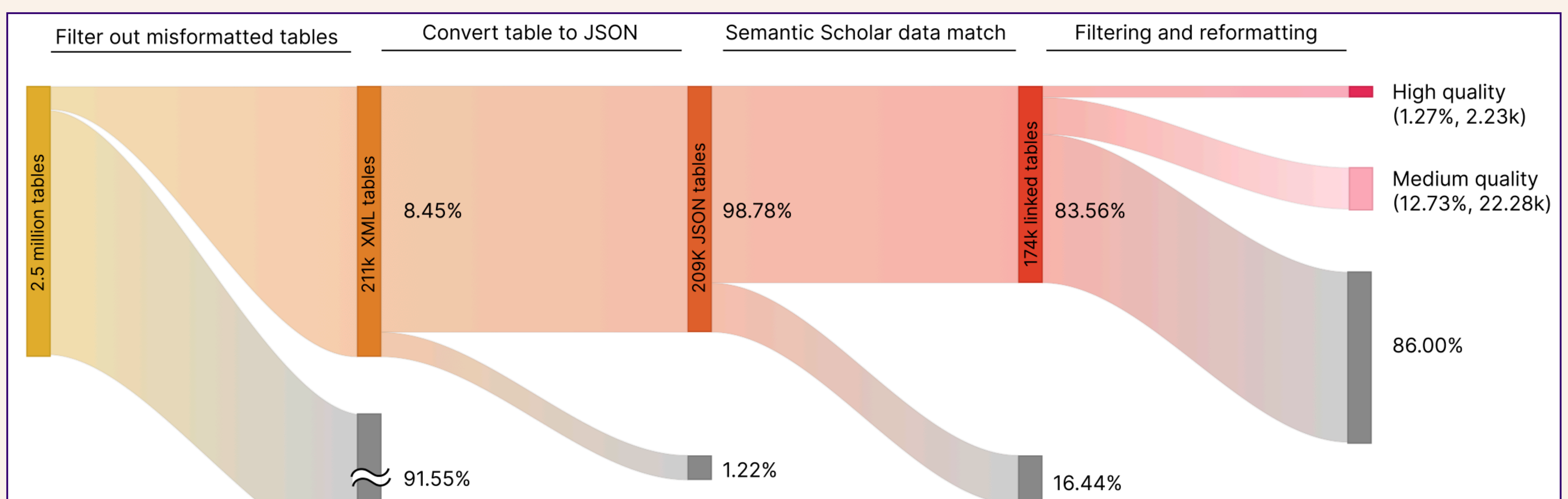
Scientists use **literature review tables** to make sense of many research papers. Can we use LMs to **generate** these automatically?



	Dataset	Size	Task	Annotations
Paper 1	KoNViD-1k	1200	VQA	114
Paper 2	LIVE-VQC	585	VQA	240
Paper 3	KoNViD-150k	153,841	VQA	5
Paper 4	Sports-1M	1,133,158	Classification	- (auto)

Curating ArxivDIGESTables

We release a high-quality **dataset of 2.2k literature review tables** curated from arXiv papers. Every table includes:
✅ table schema (columns), ✅ table values (rows), ✅ table captions, ✅ in-text references, ✅ full texts for cited papers



Data Filtering Pipeline

	Min	Max	Median	Mean	Total
Papers	1	35	3.0	4.944	11016
Aspects	2	13	3.0	3.426	7634

Aspect Type	% of Cols	Example Value
Category	35.5%	"Open" vs "Proprietary"
Entity	27.3%	"CNN/Daily Mail", "Reddit"
Numeric	21.7%	"10,000"
Text	9.7%	"...collected via various ..."
Boolean	5.8%	"✓" vs "✗"

Summary

Generating Literature Review Tables

- We introduce **two-stage decomposed generation** —(1) schema generation, (2) value generation — that outperforms naive single LM prompts.
- We also explore different ways of providing **additional context** to ground the generation (e.g., table caption, in-text references, in-context examples)

Step 1: Schema Generation →

Step 2: Value Generation →

	Dataset size	Annotation method	Intended Application	Evaluation Metric
Paper 1	1,200 video sequences	Subjectively annotated	Objective VQA method development	Subjective Mean Opinion Score
Paper 2	585 videos	Subjective video quality scores via crowdsourcing	NR video quality prediction advancement	Subjective video quality scores
Paper 3	153,841 videos	Coarsely annotated set with five quality ratings each	Deep-learning VQA model training	Spearman rank-order correlation coefficient
Paper 4	1 million YouTube videos	N/A	Large-scale video classification and action recognition	Performance improvements over baselines

Metric Development

❗ **Automatic evaluation is hard!**

Tables use **short texts** & generations have **low lexical overlap** with reference tables.

💡 Can we use **decontextualization** to expand short table texts?

💡 Can we use **LMs** to match predictions to (gold) references?

Findings

> Decontextualization + SBERT better evaluator than Llama 3, which hallucinates alignments.
> ⬆️ More provided context, ⬆️ higher recall for schema generation, but doesn't help value generation.