



MoDS: Moderating a Mixture of Document Speakers to Summarize Debatable Queries in Document Collections



Paper



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ChatGPT struggles with our new task of **debatable query-focused summarization**...

So we build a **multi-LLM summarization** framework to beat existing methods!

Document Set: [1] [2] [3] [4] [5] [6]

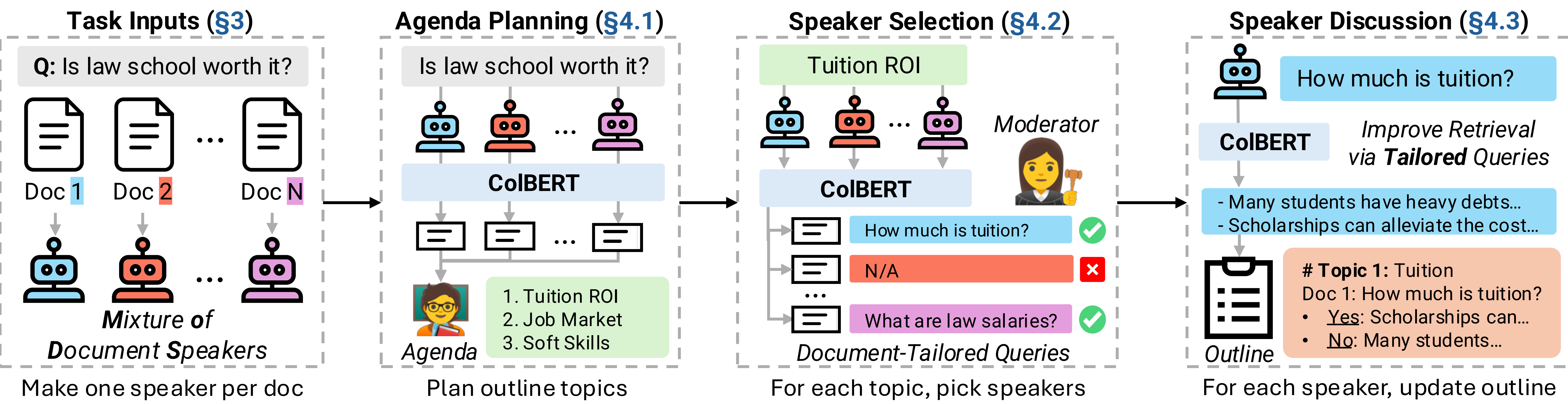
Debatable Query: Is EU expansion and membership itself a good idea?

Debatable Query-Focused Summary (2 topics)

Topic 1: Economic Growth
EU expansion is expected to boost the GDP growth of acceding countries by 1.3-2.1% annually, while existing members could see a cumulative GDP increase of 0.7 percentage points [1]. Studies suggest that the economic gains from the accession of Central and Eastern European countries could reach €10 billion for the EU-15 and €23 billion for new members [1]. The accession is also seen as an opportunity for creating new markets and stabilizing the continent economically [2].

Imbalanced and Low Coverage

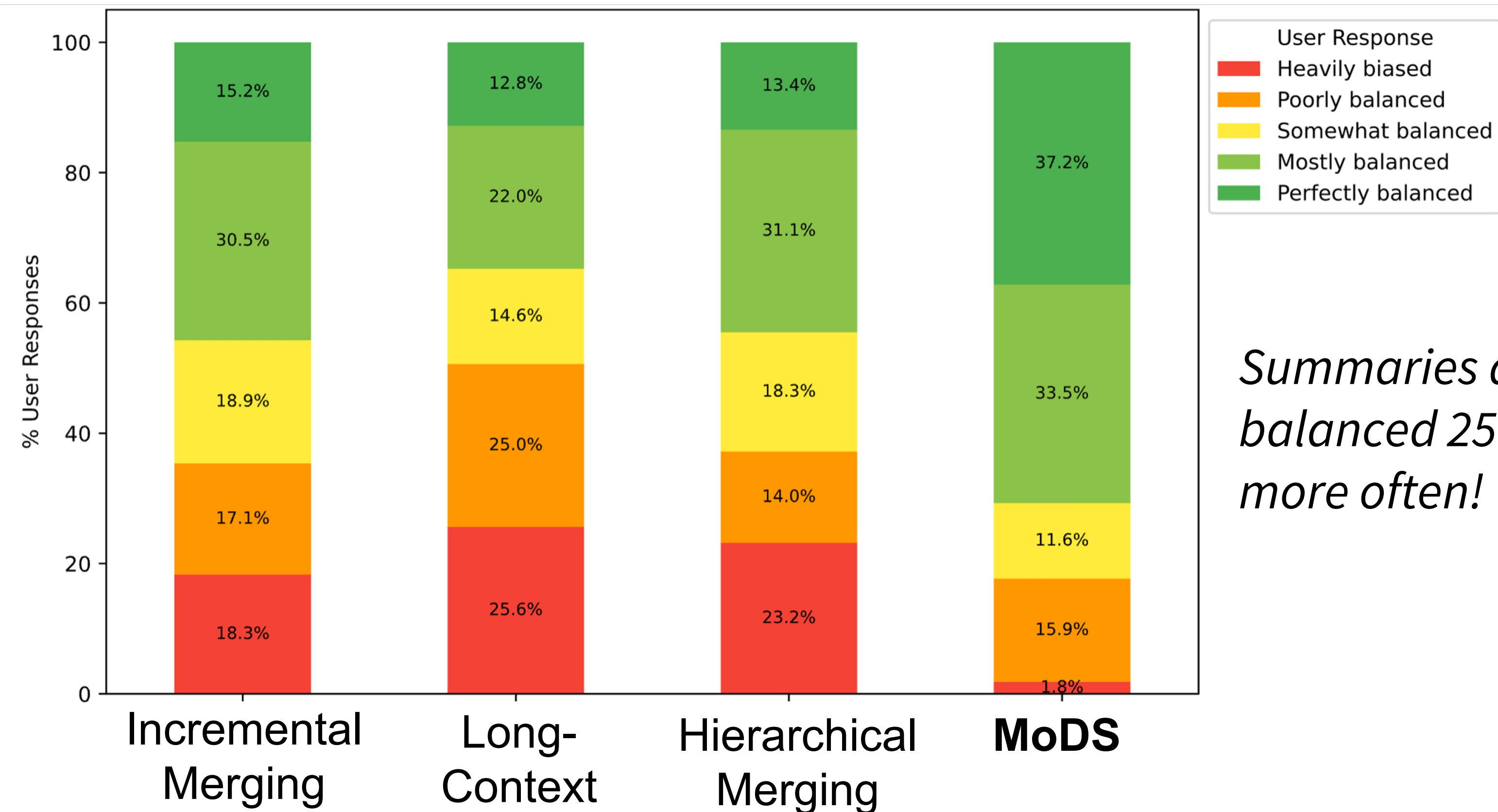
MoDS: Moderating a Mixture of Document Speakers



Finding 1: MoDS beats all baselines in citation coverage and balance for summaries + topic paragraphs

Overall Summary				Topic Paragraphs					
# Top.	Model	DC (↑)	Fair (↓)	Faithful (↓)	DC (↑)	Fair (↓)	Faithful (↓)	Cite Acc. (↑)	All / Avg Sents
3	MoDS-Topic (Ours)	0.8724*	0.0701*	0.0235*	0.6066*	0.1255*	0.0789*	0.982	8.99 / 3.00
	MoDS-All (Ours)	0.8457*	0.0786*	0.0273*	0.5508	0.1463*	0.0938*	0.987	8.87 / 2.96
	Long-Context	0.5877	0.2094	0.1790	0.2798	0.4336	0.4028	0.953	9.02 / 3.01
	RAG-All	0.6125	0.1544	0.1040	0.3229	0.3176	0.2701	0.997	9.01 / 3.00
	RAG-Doc	0.7171	0.1180	0.0664	0.3504	0.3233	0.2748	0.961	9.01 / 3.00
	Hierarchical	0.7868	0.0907	0.0374	0.3639	0.2980	0.2452	0.983	9.02 / 3.01
	Incremental-All	0.5566	0.2579	0.2089	0.3919	0.3243	0.2765	0.950	8.91 / 2.97
	Incremental-Topic	0.6152	0.2415	0.1970	0.4707	0.3128	0.2674	0.954	9.03 / 3.01
	Cluster	0.7102	0.1106	0.0725	0.3632	0.3106	0.2737	0.931	9.04 / 3.01
RAG+Cluster	0.6811	0.1405	0.0894	0.3428	0.3200	0.2689	0.977	9.01 / 3.00	

Finding 2: Humans find our summaries more balanced



Finding 3: Intermediate outlines are useful!

Query: Are EVs beneficial for individuals and governments?

Topic 1: EVs as Energy Storage

- Document 1: How can EVs be used as energy for the power grid?
 - Yes: EVs act as energy stores for power grids when not driven
- Document 7: Why did GM choose lead-acid batteries for the EV1?
 - Yes: GM chose lead-acid batteries for durability + reliability
 - No: A kg of lead batteries can store 0.4% energy vs. a kg of gas
 - No: EV1s need 1175-lb of lead-acid battery to go just 90 miles

Topic 2: EV Affordability and Market

- Document 2: What are the features/price of the Th!nk City EV?
 - Yes: The Th!nk City electric car is priced under \$25,000
- Document 5: How did the Bush's stance affect the EV market?
 - No: The Bush administration supported the removal of EV quotas
- Document 6: What is Vinod Khosla's view on market penetration?
 - No: He said these cars are likely to get 1% market penetration
 - No: You must pay \$5,000 more to save half a ton of carbon a year