

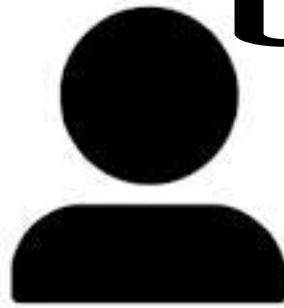
On Demand Article Generation of Events in Real Time

Alexander Martin

Department of Computer Science

Johns Hopkins University

On Demand Article Generation



Can you tell me about the Notre-Dame Fire?

Sure!

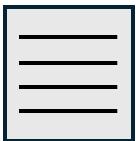
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The fire destroyed the cathedral's wooden spire (flèche) and most of the wooden roof and severely damaged the cathedral's upper walls.

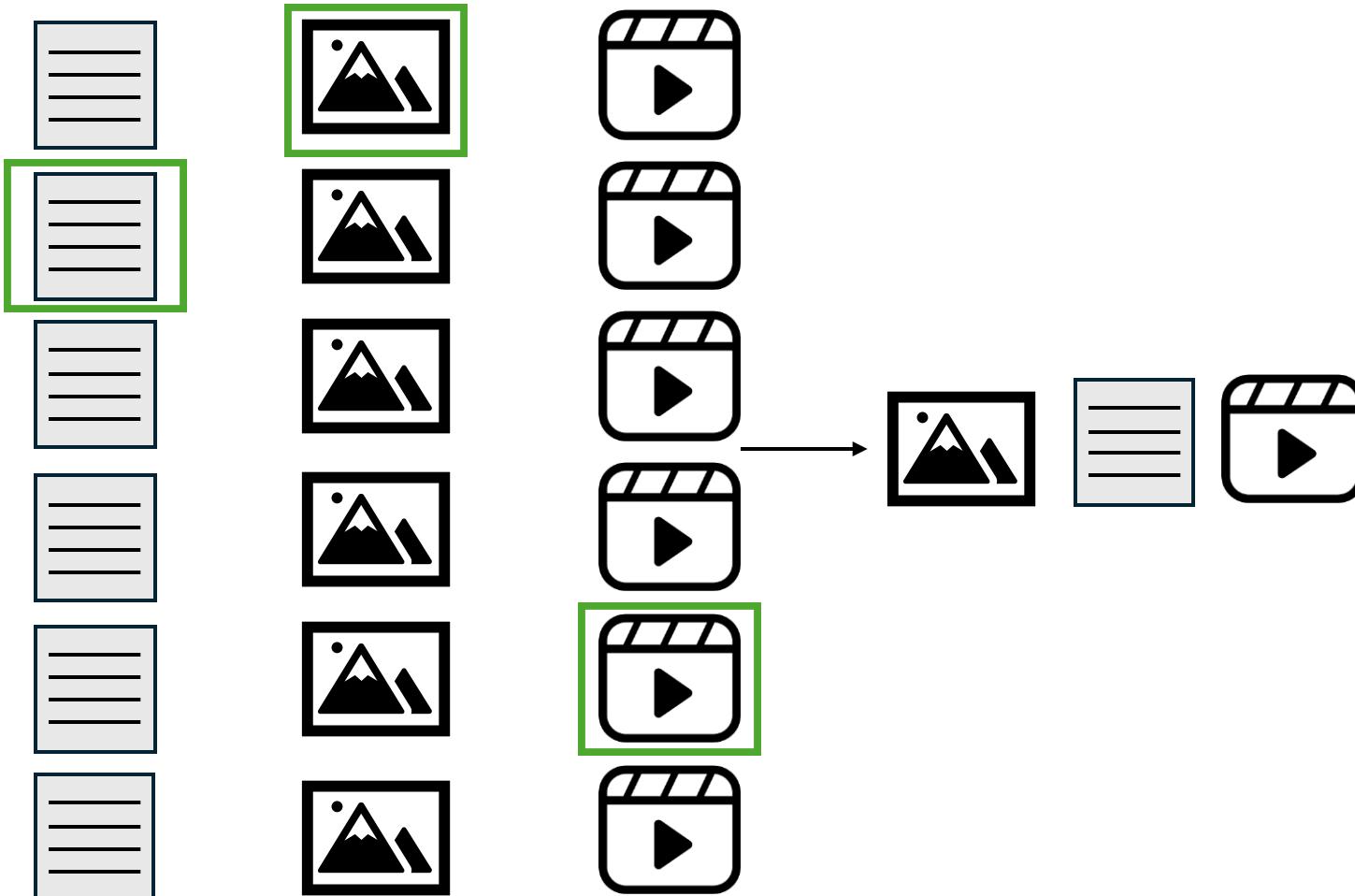
By September 2021, donors had contributed over €840 million to the rebuilding effort.[9] The cathedral reopened on 7 December 2024 after three years of reconstruction.[10][11]



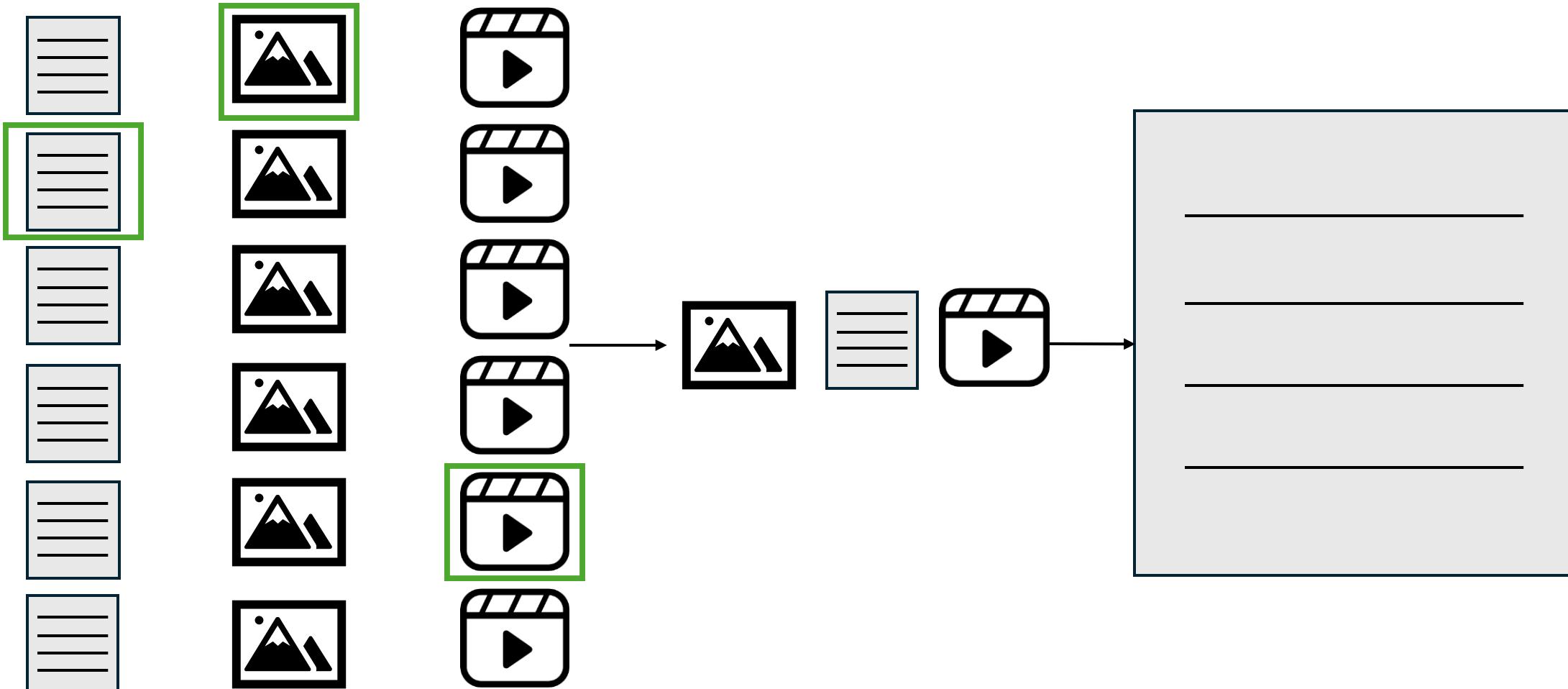
How to write an article?



How to write an article?



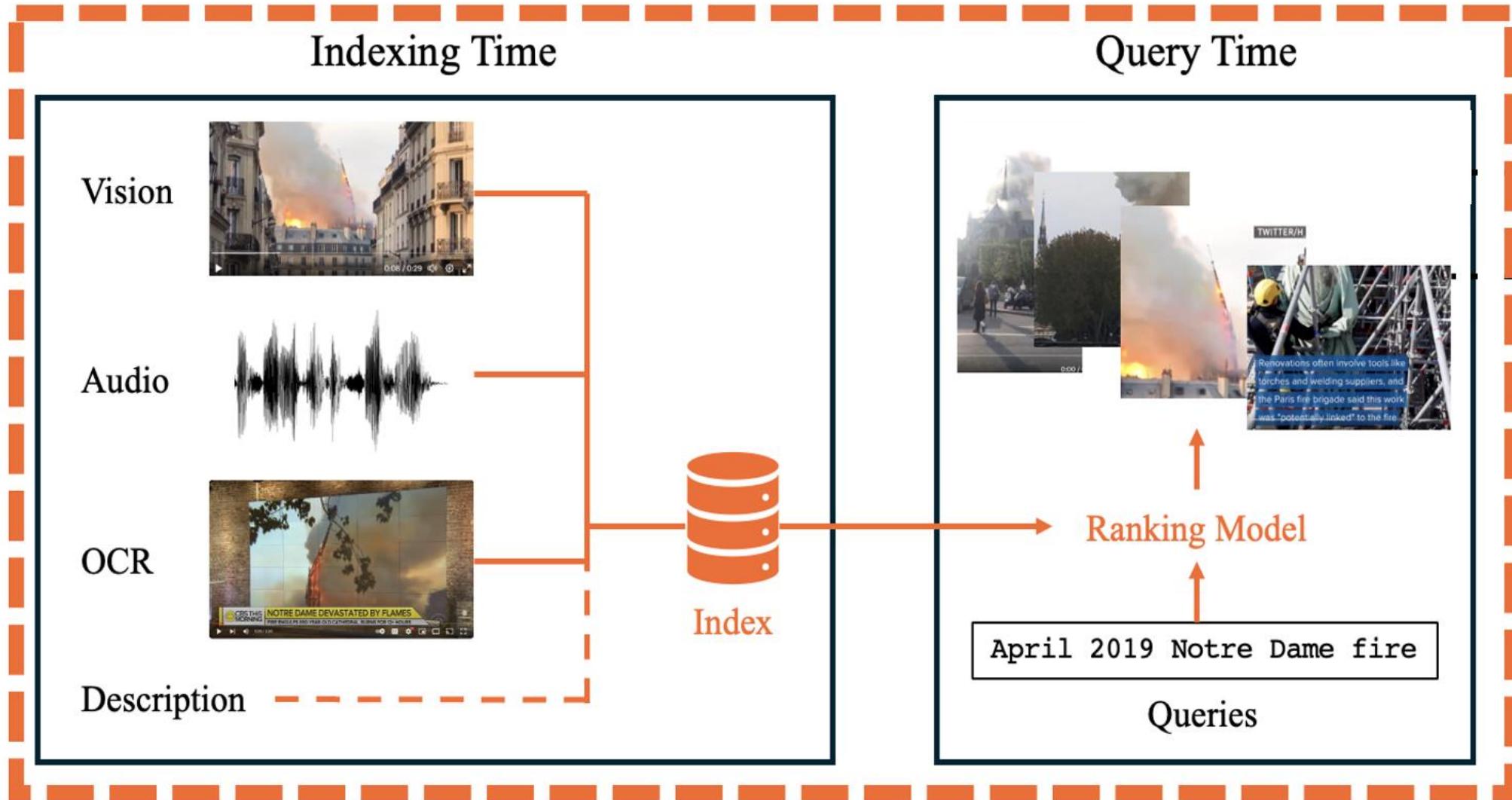
How to write an article?



Retrieval

Information Seeking

Video Retrieval



Multivent

Emergencies



Politics



Social Events



Science & Business



Multivent

Emergencies



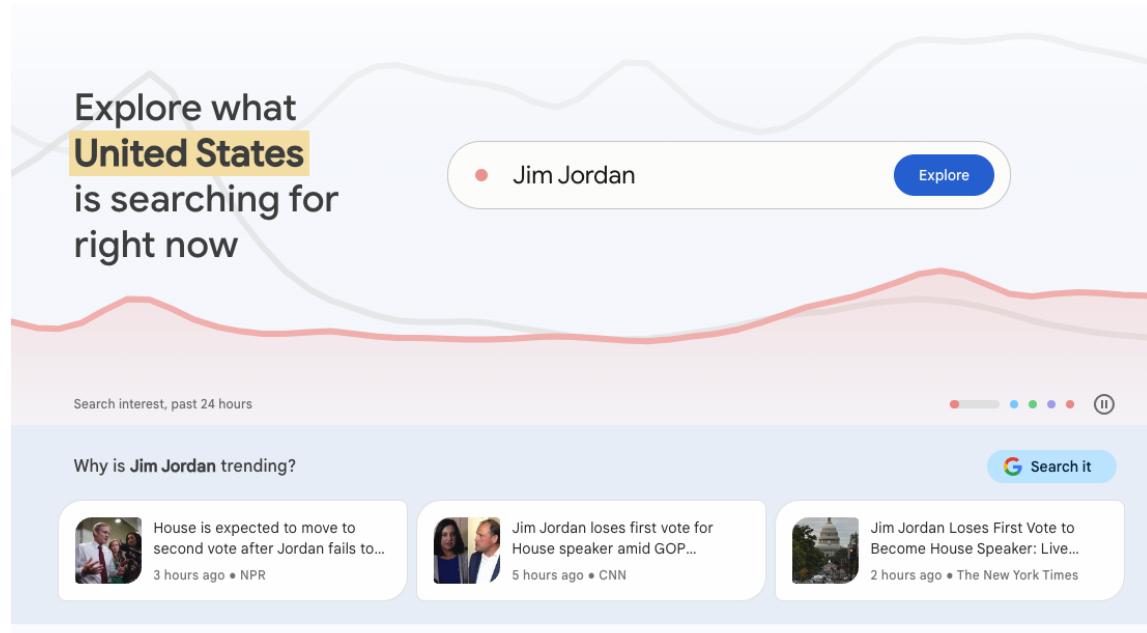
Politics



Social Events



Science & Business



Multivent

Emergencies



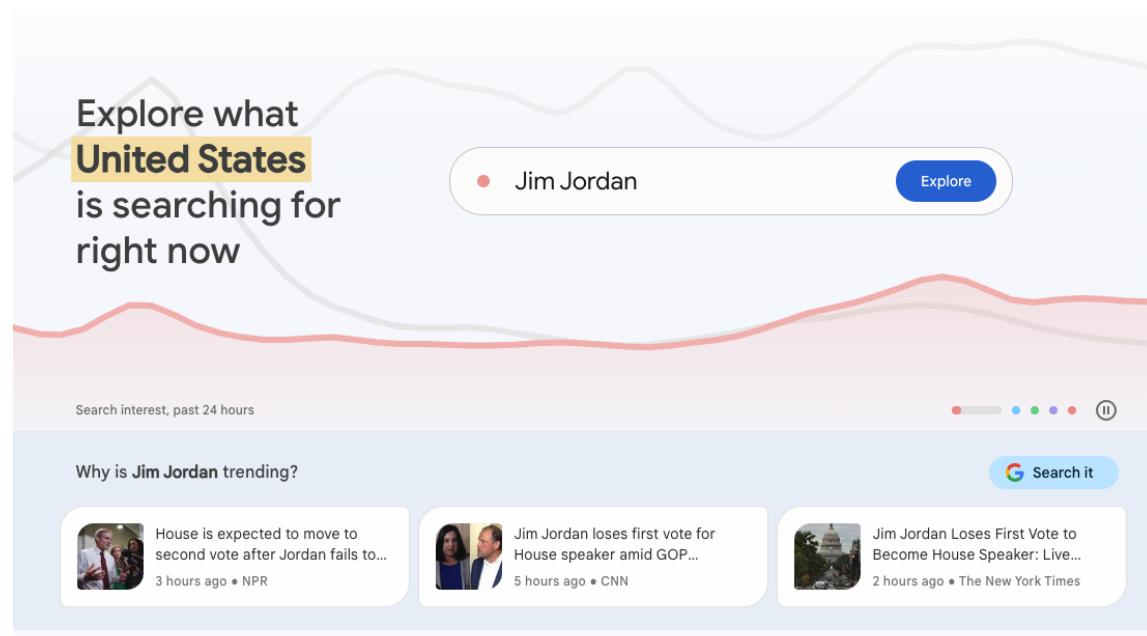
Politics



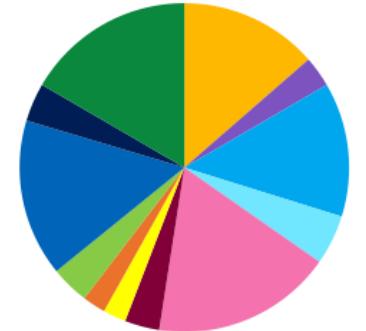
Social Events



Science & Business



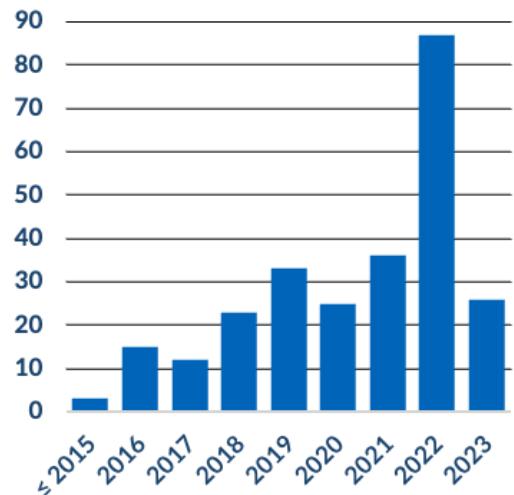
CURRENT EVENT LOCATIONS



China
Russia
South Korea
UK
UAE
International

Egypt
Saudi Arabia
Taiwan
Ukraine
US
Other

CURRENT EVENTS BY YEAR



MultiVENT – Video Types

Easy



Professional



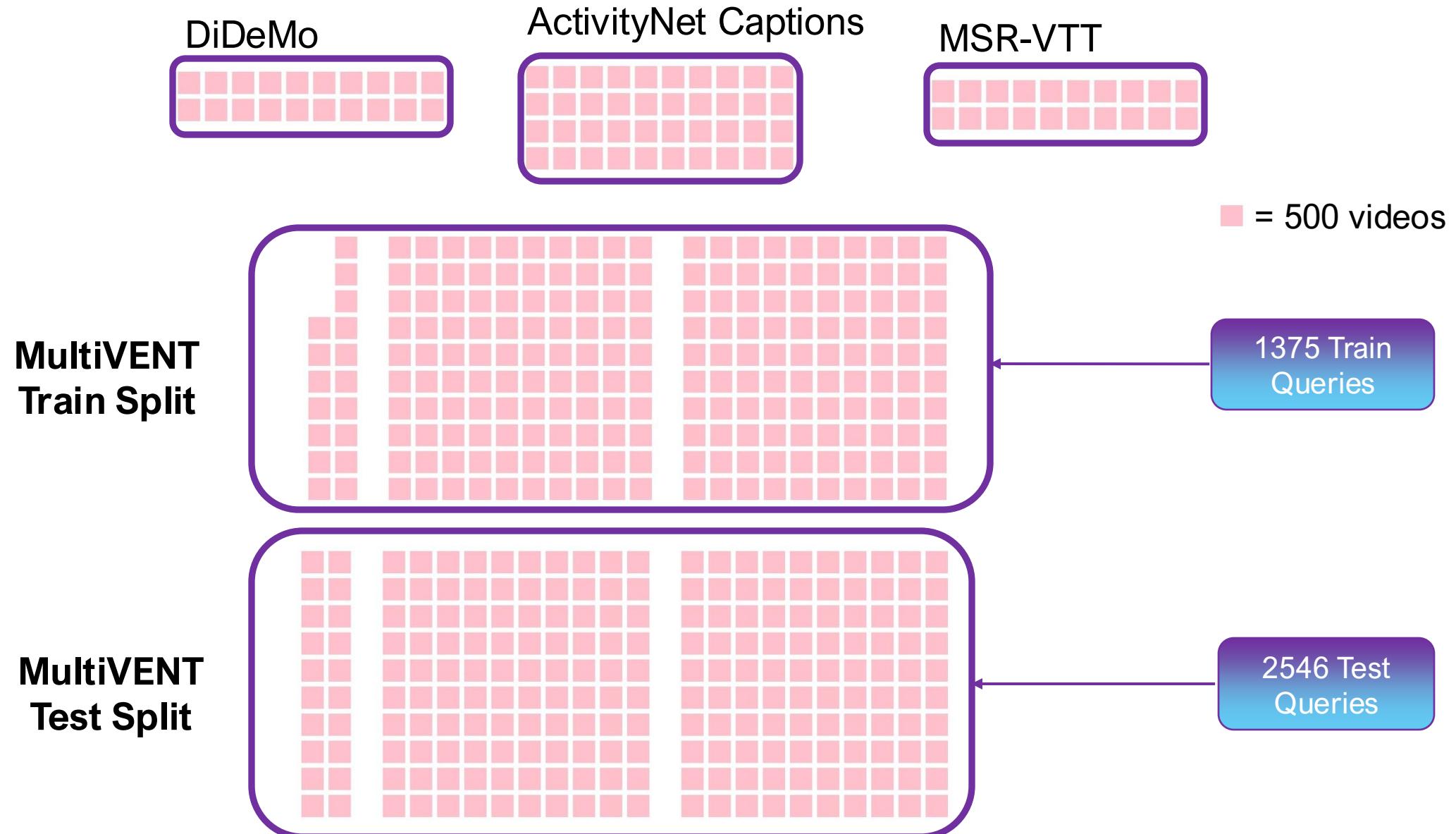
Edited



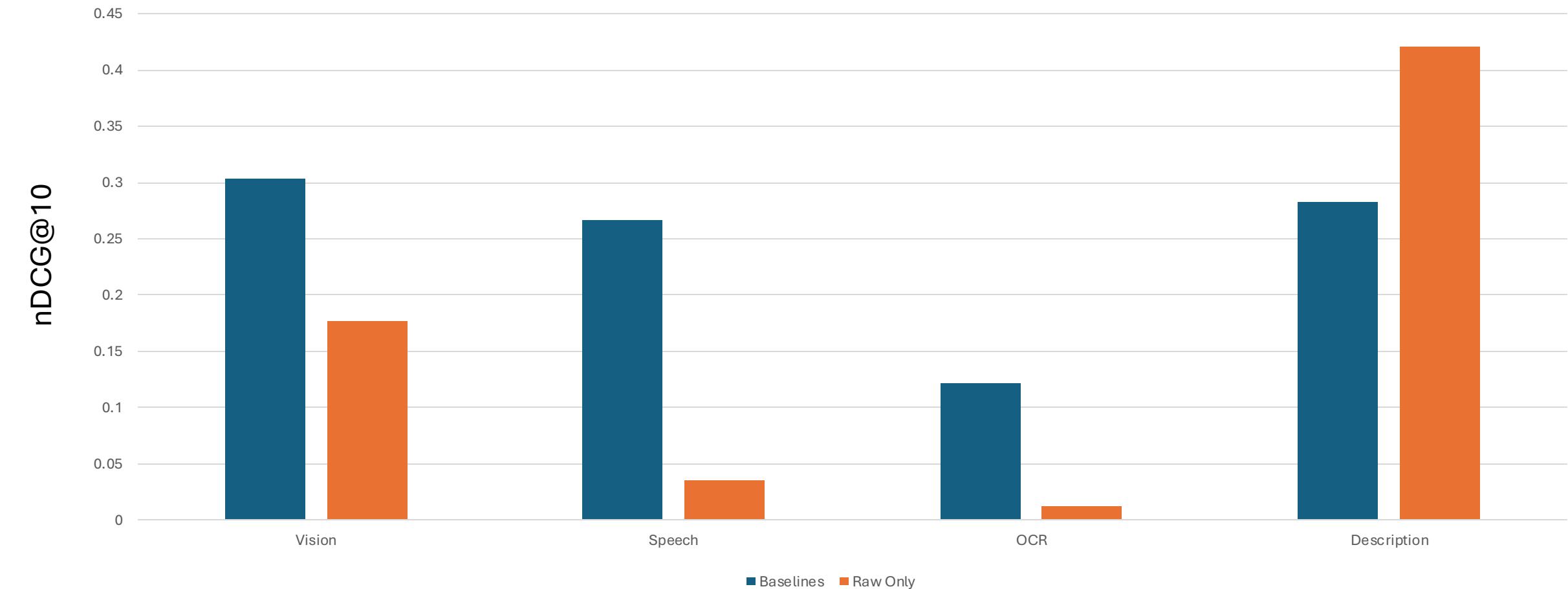
Raw Footage

Hard

MultiVENT Size Comparison



MultiVENT Baselines

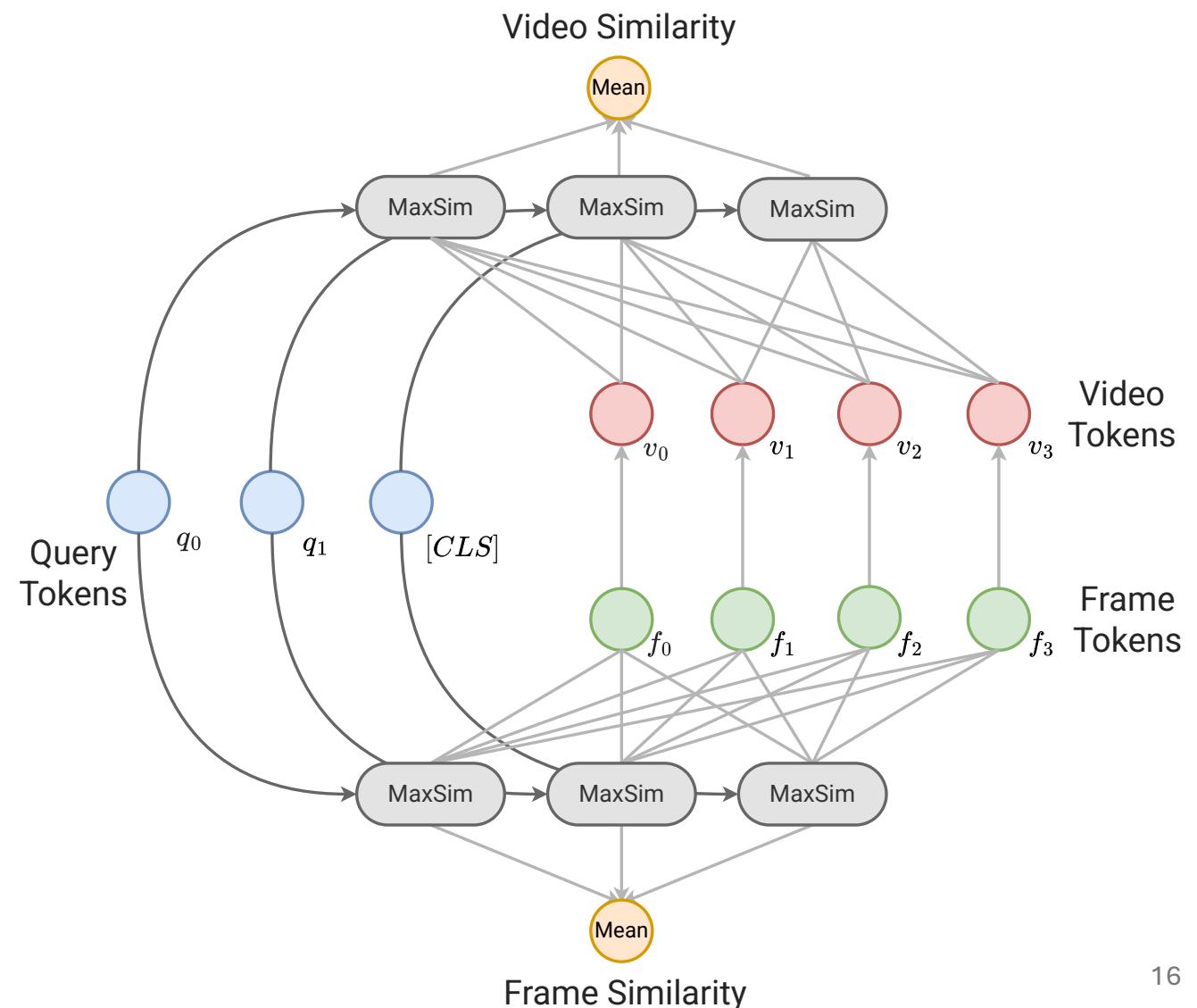


Current Limitations

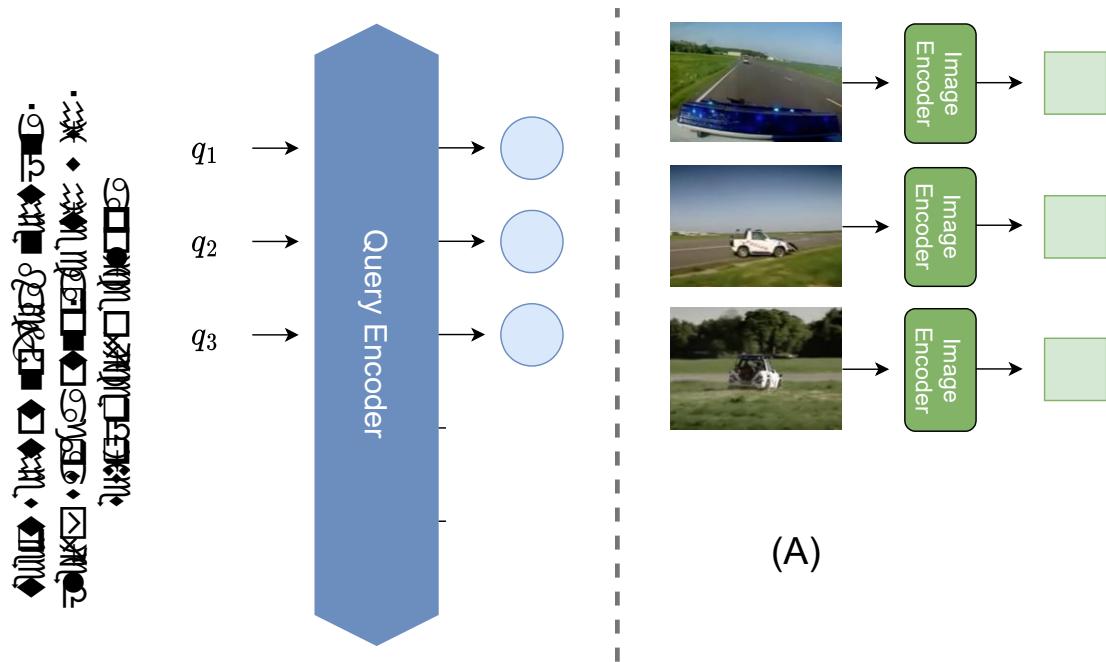
- Retrieval is not efficient
 - State of the art VideoLLMs are expensive to run on 109K+ videos
- Retrieval doesn't use multiple modalities
 - Most methods are vision only

Video-ColBERT – Efficient Video Retrieval

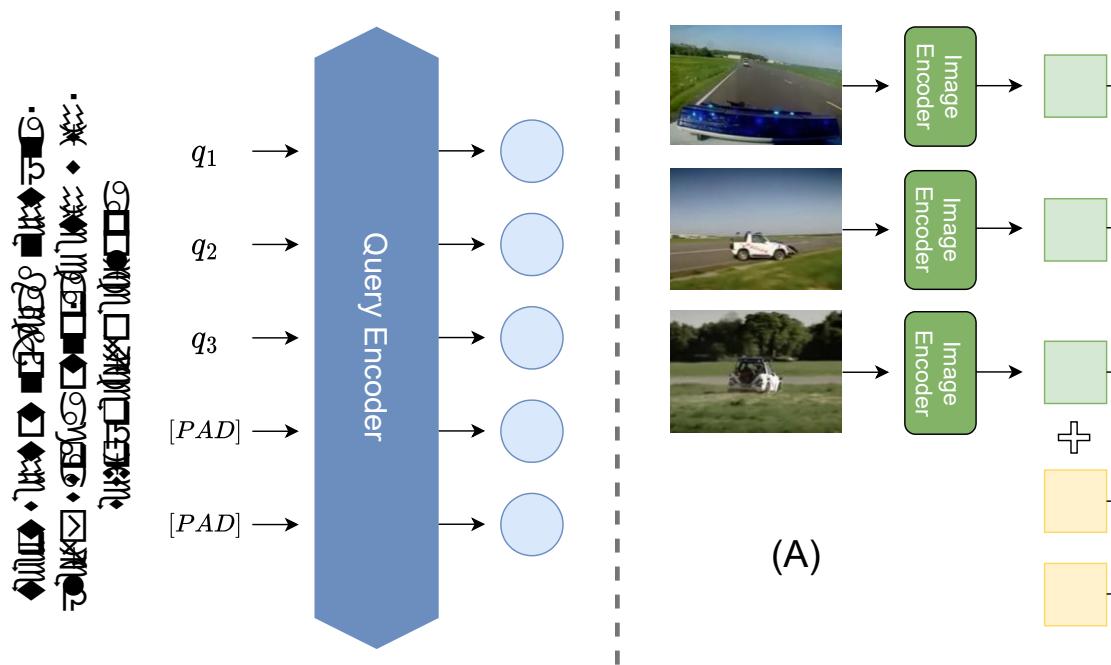
- Can we do video retrieval similar to SOTA text? (multi-vector sim)
- What will be the performance trade off compared to expensive methods?
- Will it scale to 100K+ videos?



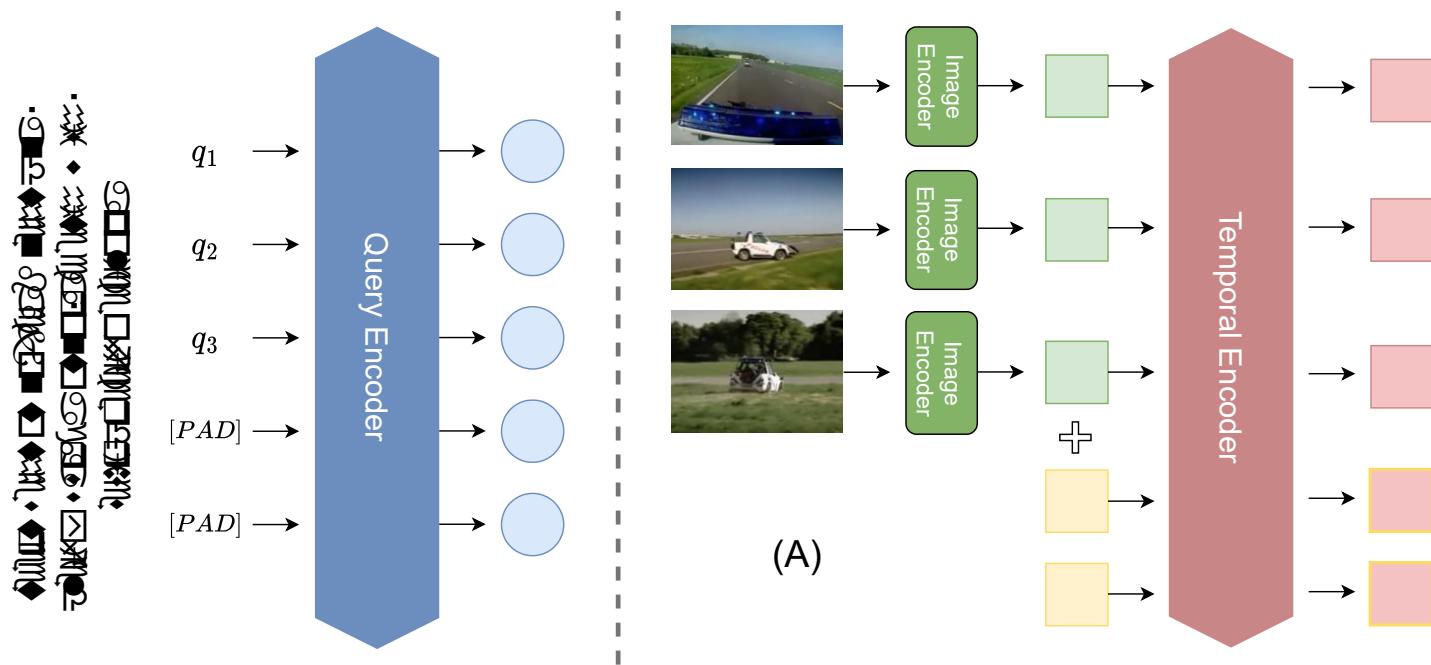
Video-ColBERT – Efficient Video Retrieval



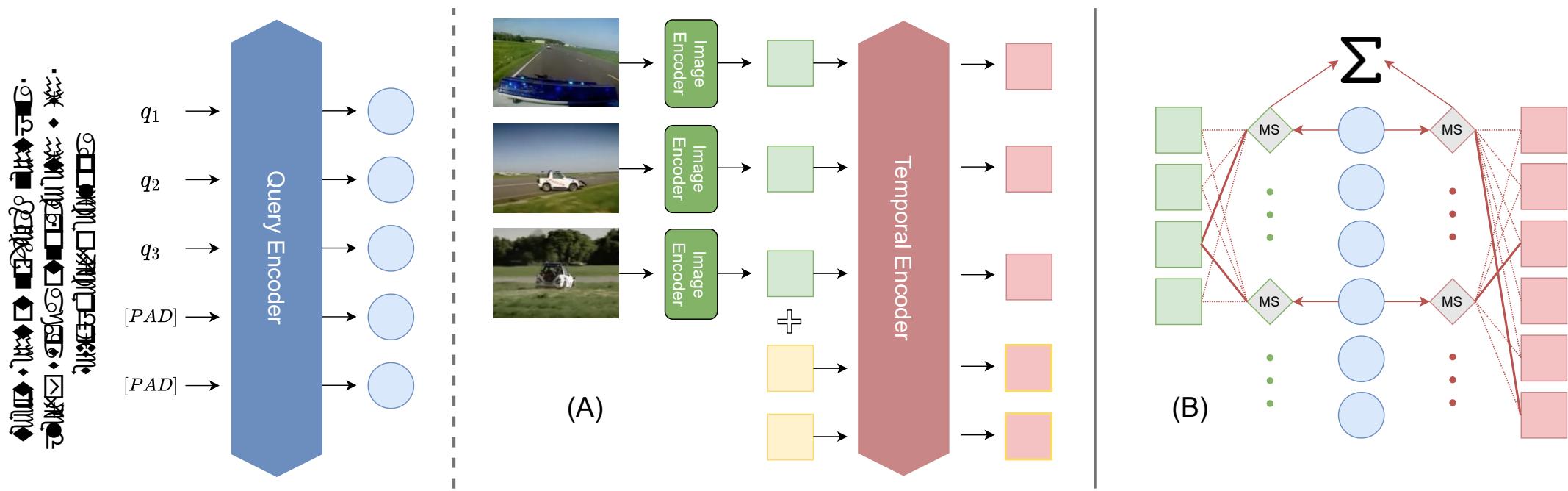
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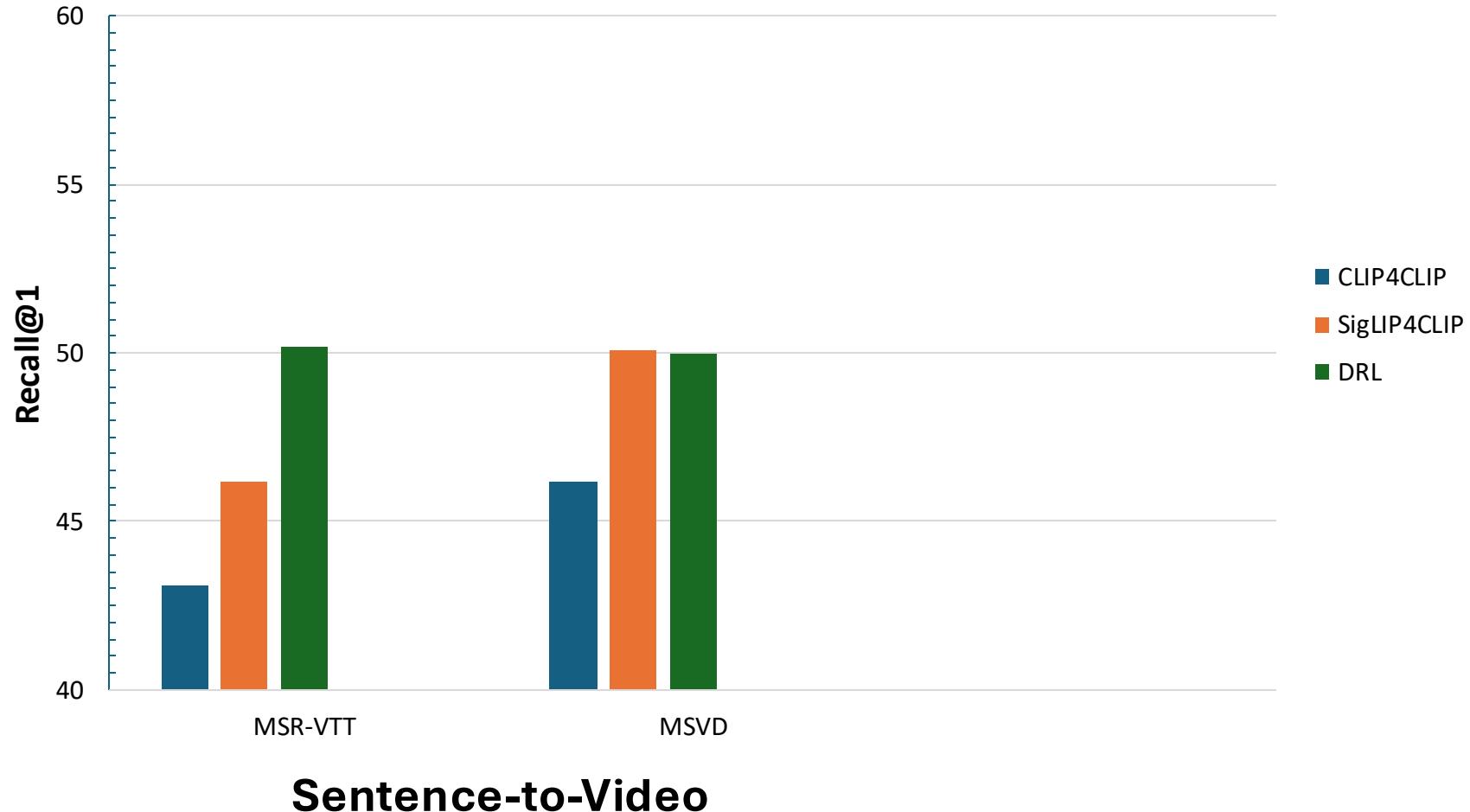
Video-ColBERT – Efficient Video Retrieval



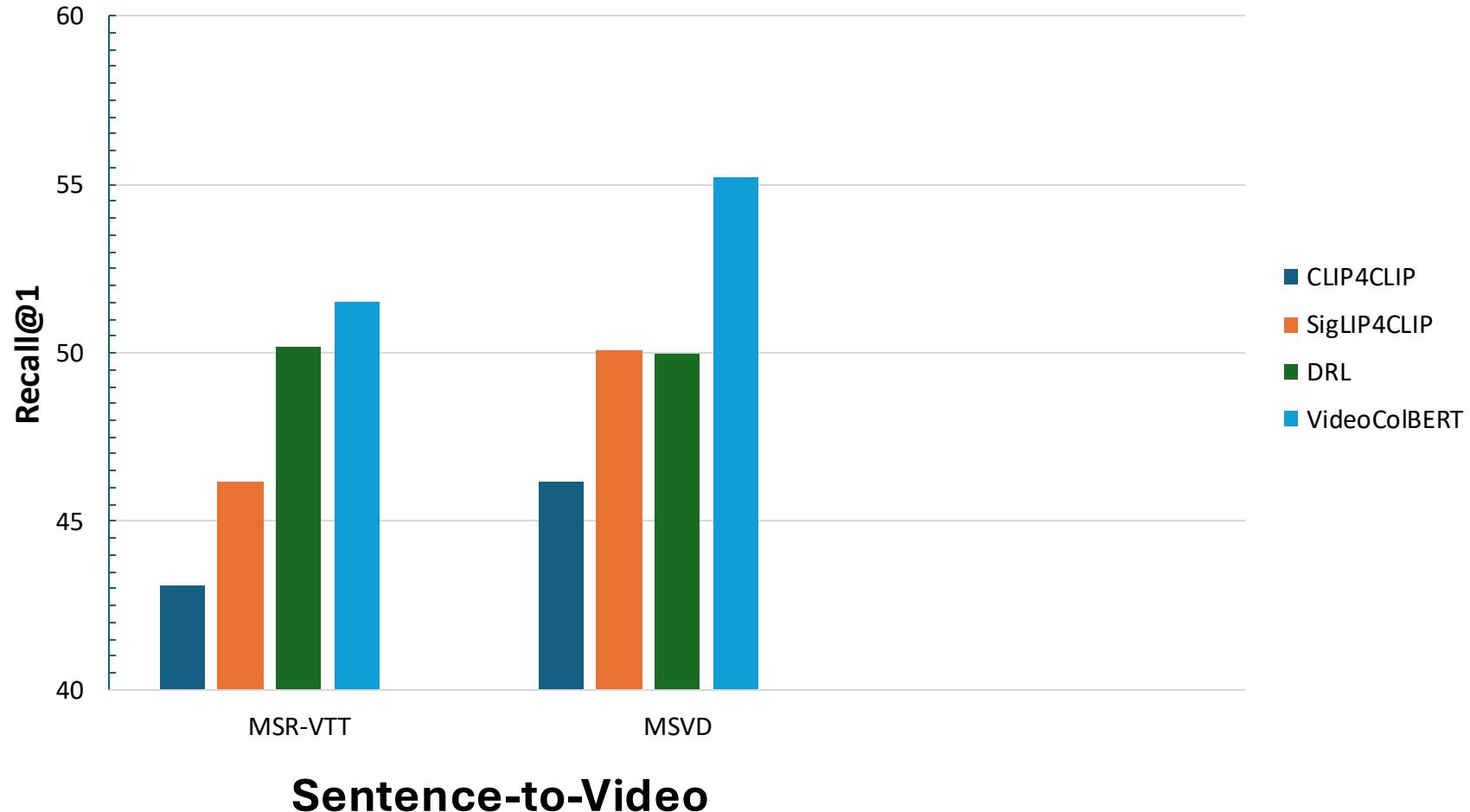
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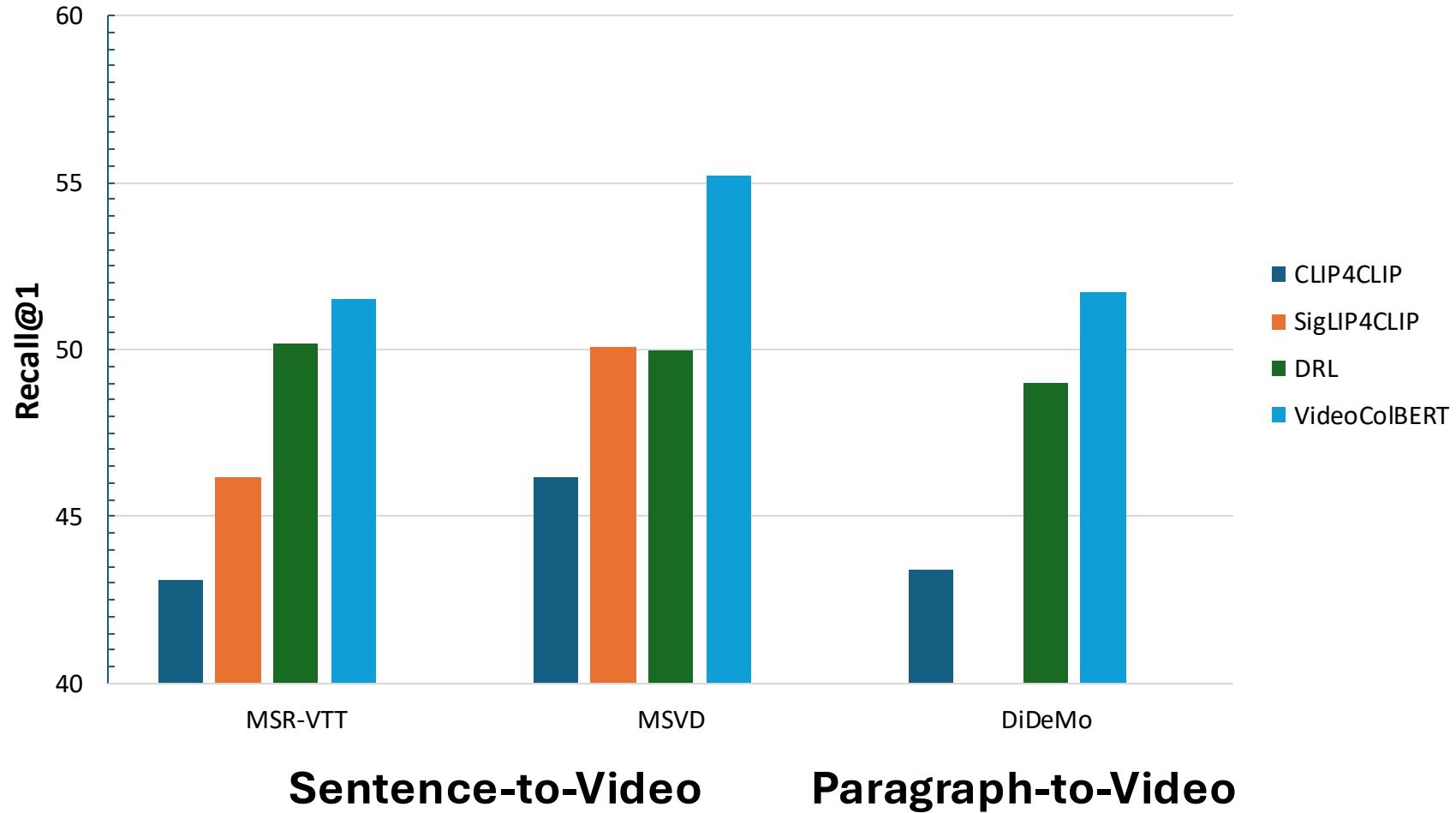
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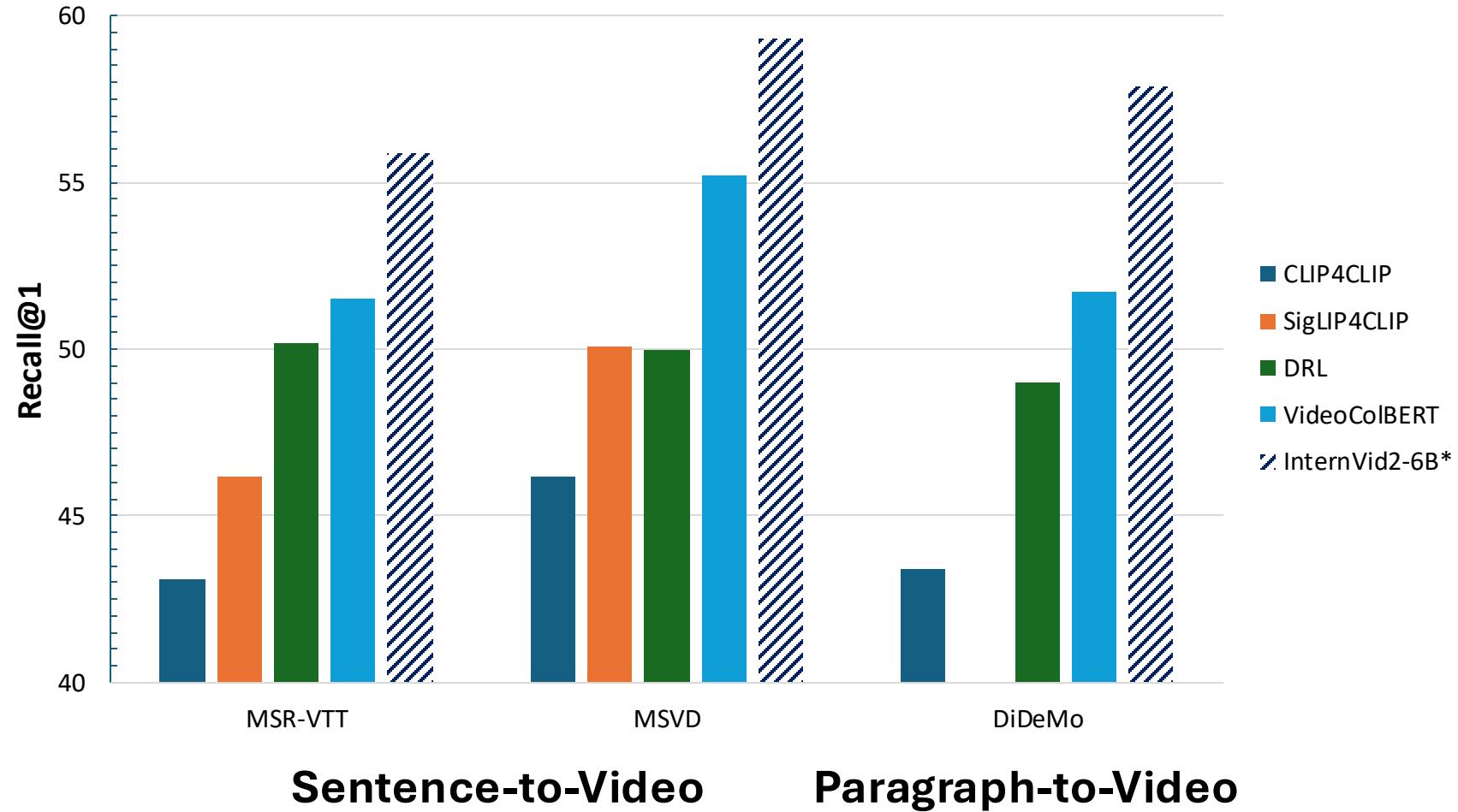
Video-ColBERT – Efficient Video Retrieval



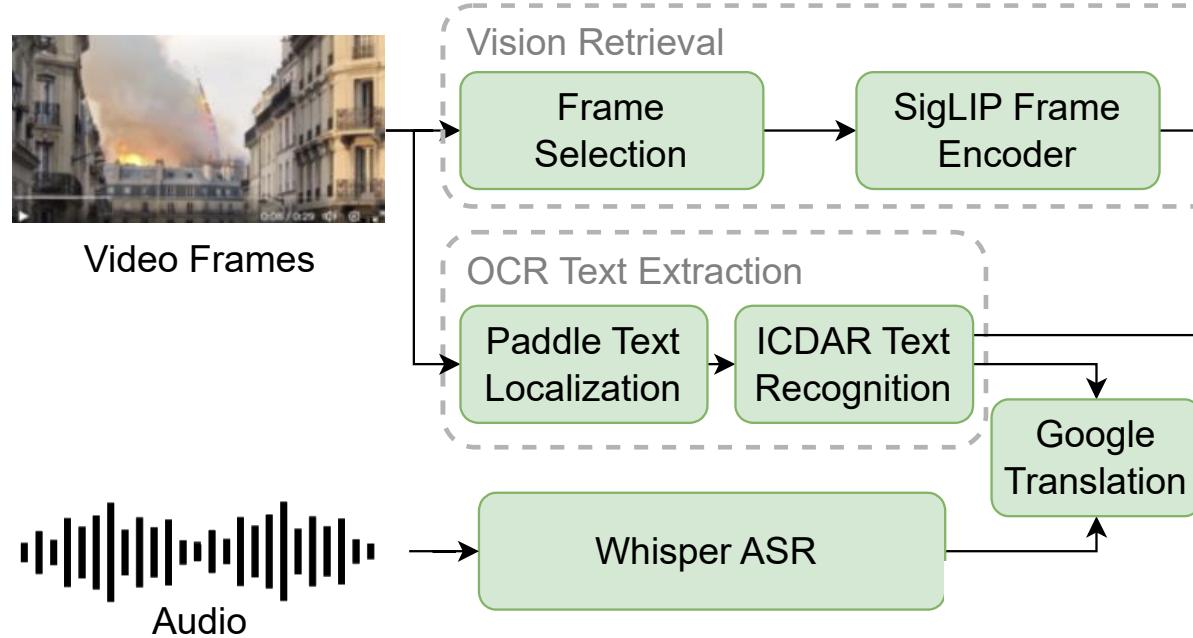
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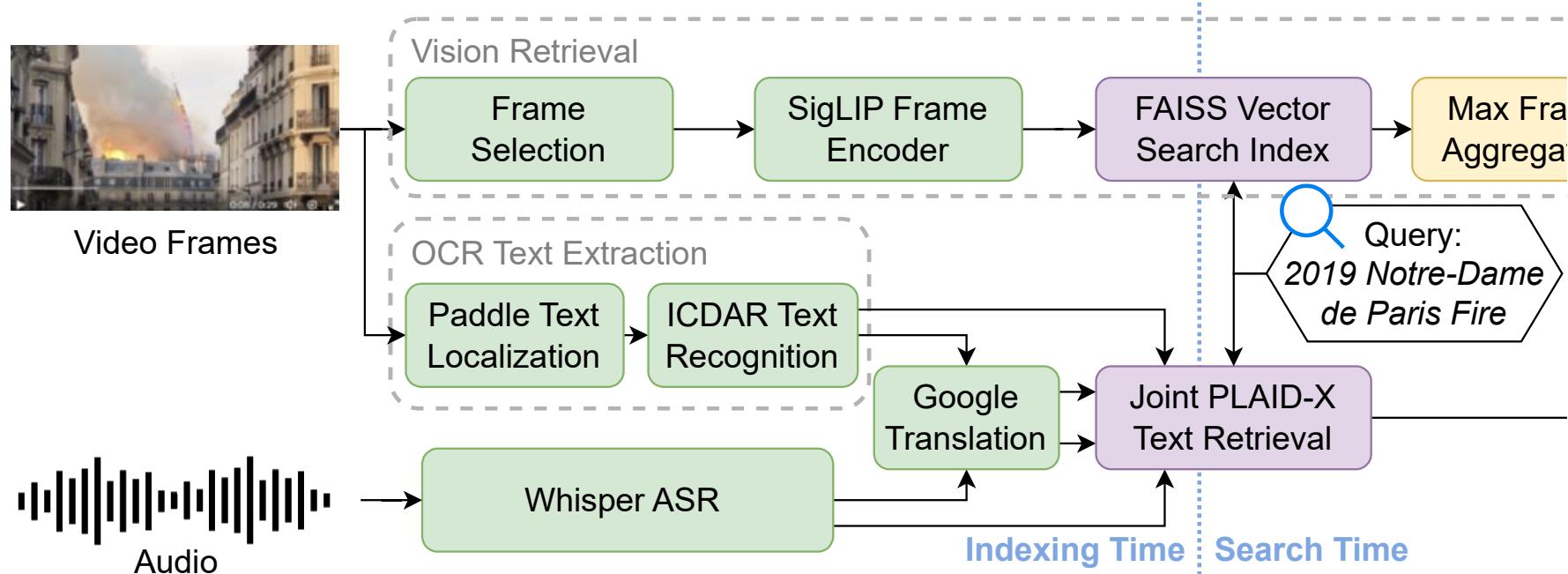
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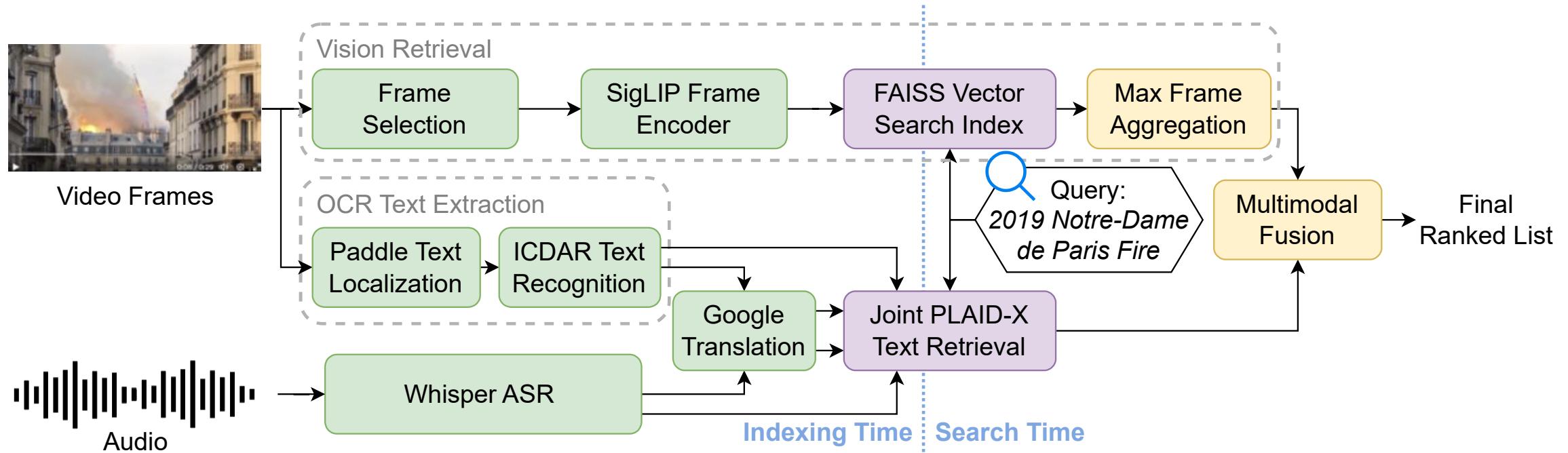
Multimodal Reciprocal Rank Fusion



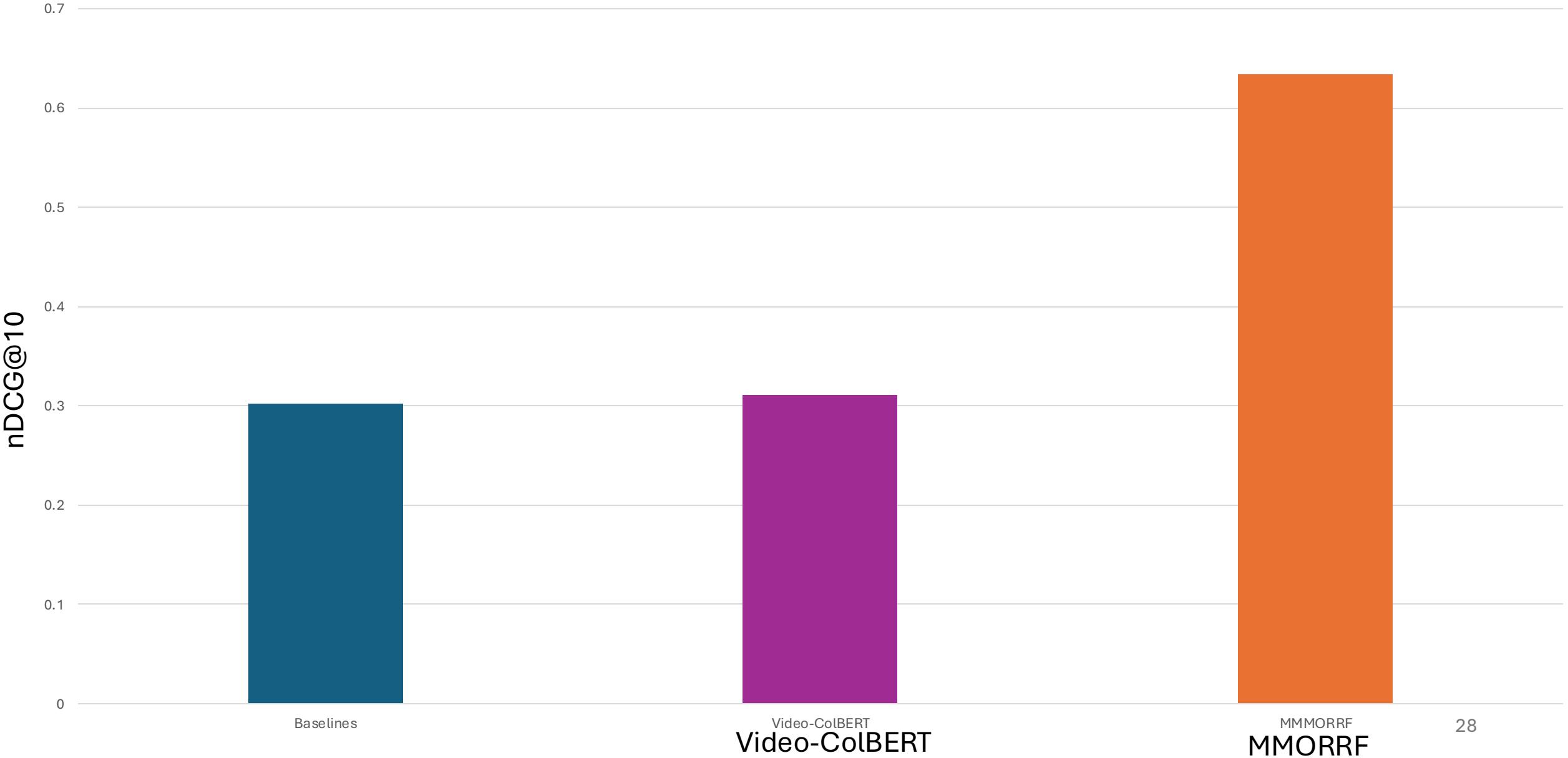
Multimodal Reciprocal Rank Fusion



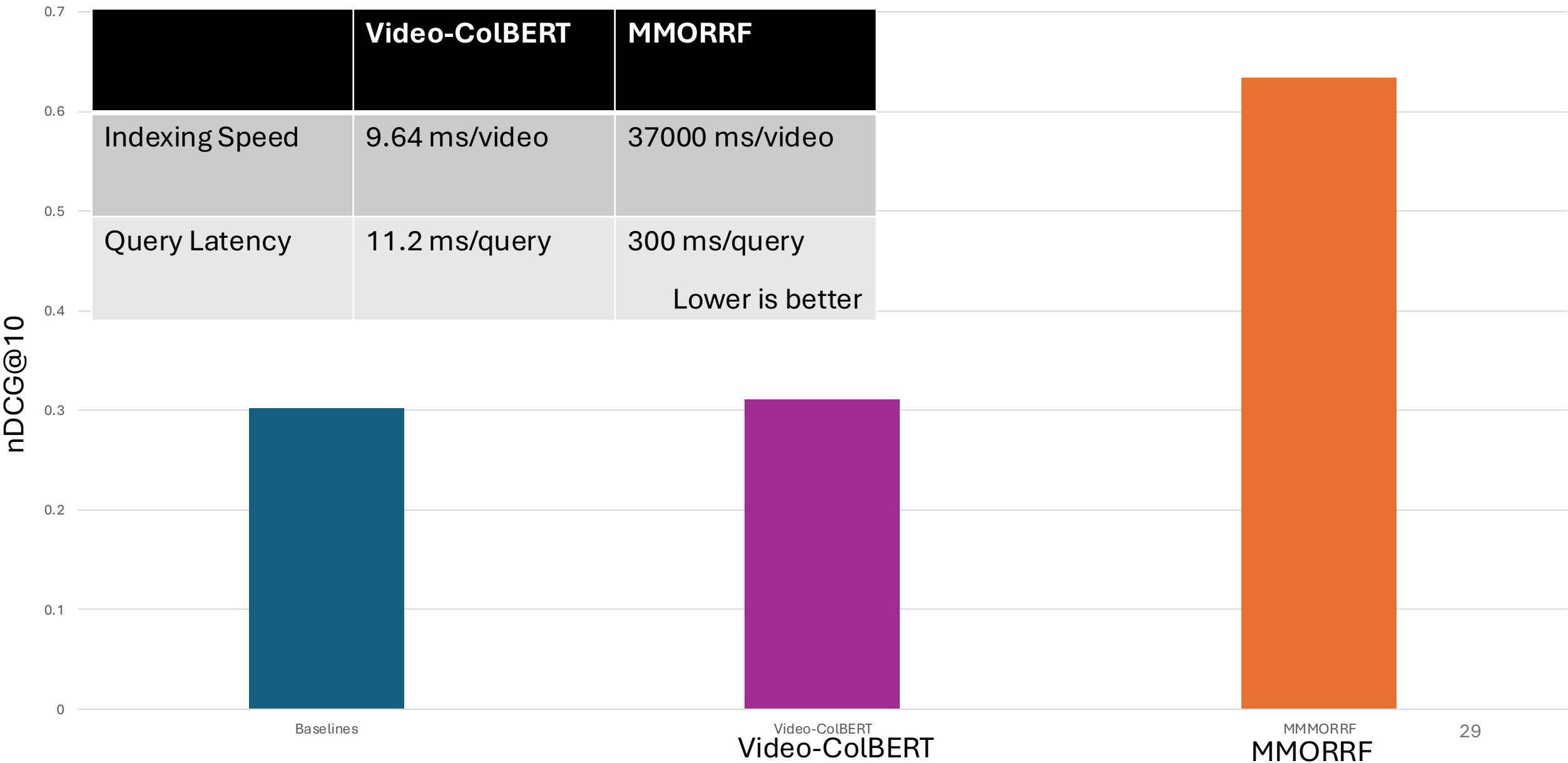
Multimodal Reciprocal Rank Fusion



MultiVENT Results



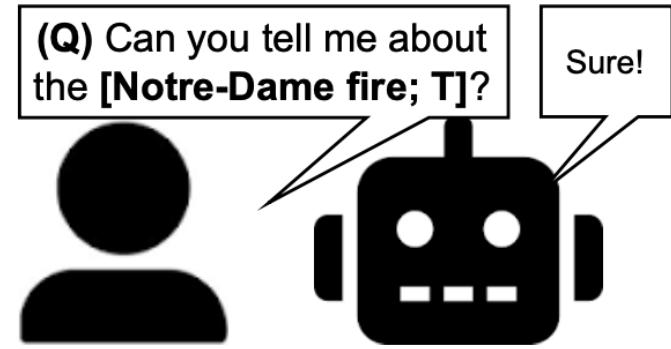
MultiVENT Results



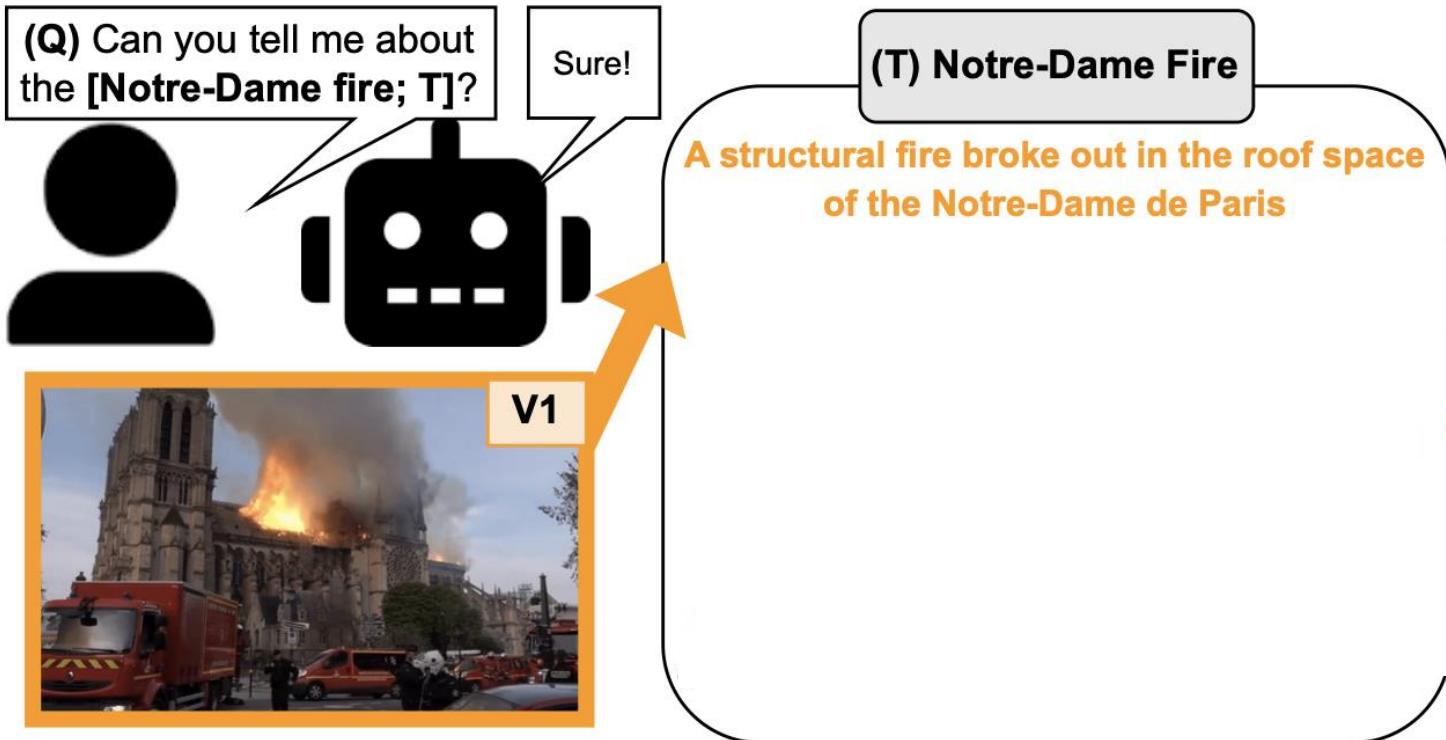
Article Generation

Information Synthesis

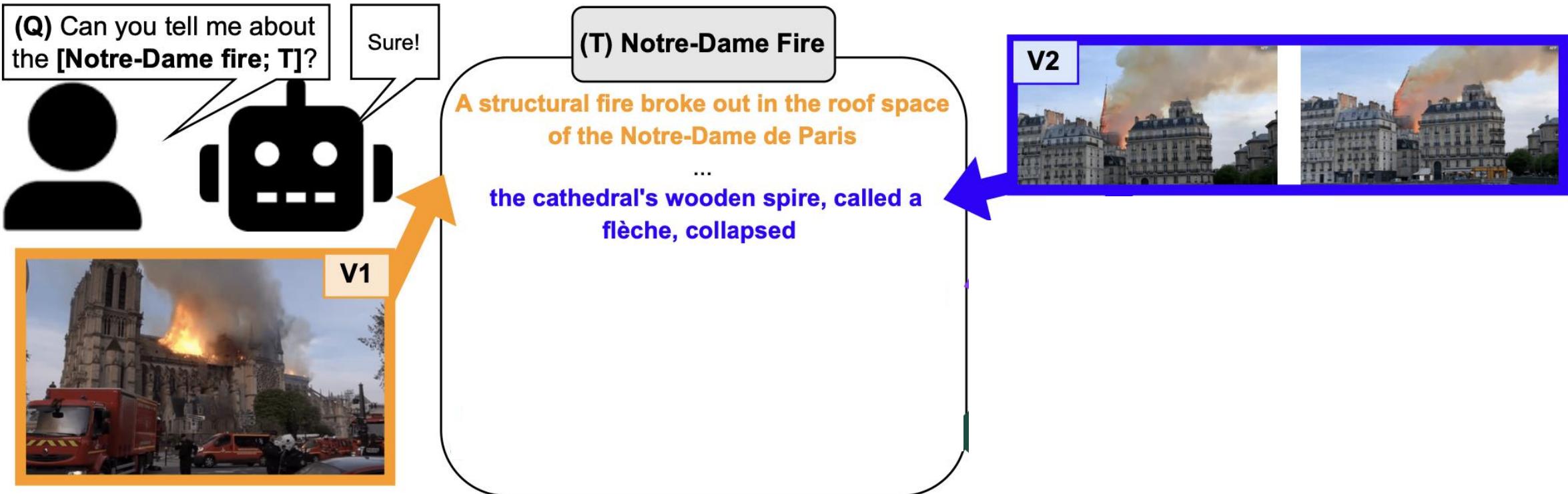
WikiVideo: Article Generation from Multiple Videos



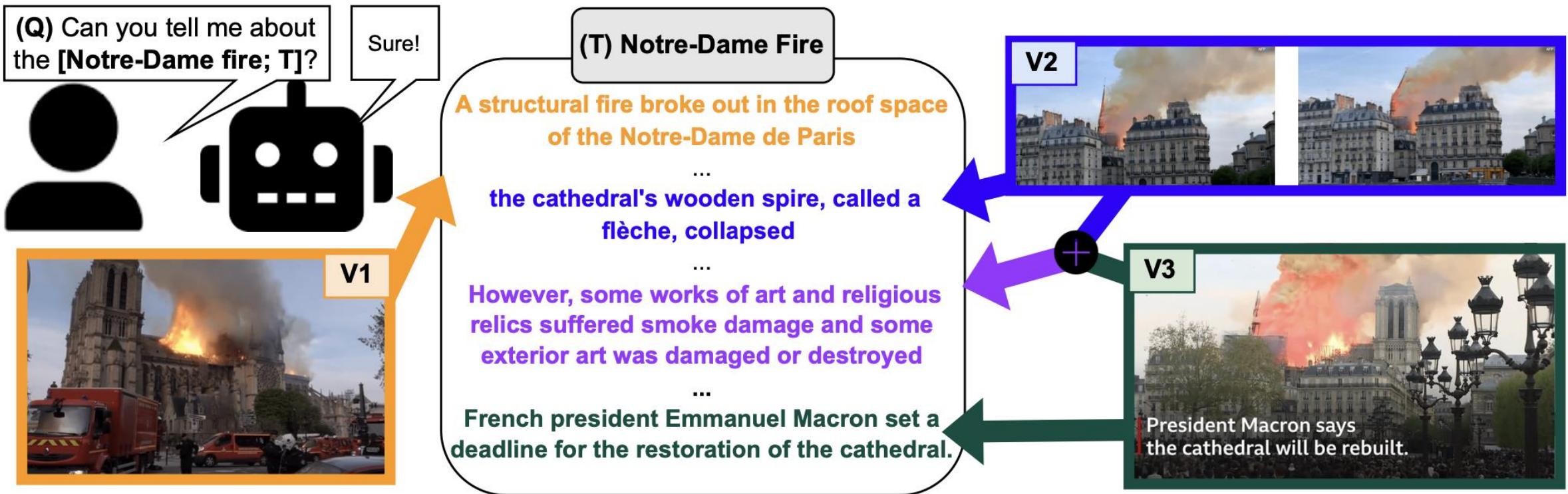
WikiVideo: Article Generation from Multiple Videos



WikiVideo: Article Generation from Multiple Videos



WikiVideo: Article Generation from Multiple Videos



WikiVideo: Collection Process

Notre-Dame fire

文 57 languages ▾

Article Talk Read Edit View history Tools Coordinates: 48.8530°N 2.3500°E

From Wikipedia, the free encyclopedia

On 15 April 2019, at 18:18 CEST, a structural fire broke out in the roof space of Notre-Dame de Paris, a medieval Catholic cathedral in Paris, France.

The fire, which investigators believe was started by a cigarette or an electrical short circuit,^[5] destroyed the cathedral's wooden spire (flèche) and most of the wooden roof and severely damaged the cathedral's upper walls. The vaulted stone ceiling largely contained the burning roof as it collapsed, preventing extensive damage to the interior. Many works of art and religious relics were moved to safety, but others suffered smoke damage, and

Notre-Dame fire



Notre-Dame de Paris aflame as seen from Square René-Viviani

WikiVideo: Collection Process

Notre-Dame fire

Article Talk

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Notre-Dame fire

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1

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A structural fire broke out.

AUDIO VIDEO OCR NONE

The fire broke out on 15 April 2019.

AUDIO VIDEO OCR NONE

The fire broke out just before 18:20 CEST.

AUDIO VIDEO OCR NONE

The fire broke out in the roof space of Notre-Dame de Paris.

AUDIO VIDEO OCR NONE

Notre-Dame de Paris is a medieval Catholic cathedral.

AUDIO VIDEO OCR NONE

WikiVideo: Collection Process

Notre-Dame fire

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 AUDIO VIDEO OCR NONE
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 AUDIO VIDEO OCR NONE

VIDEO CORPUS

VIDEO CORPUS

Notre-Dame de Paris on fire

Interior of Notre-Dame de Paris

...

WikiVideo: Collection Process

Notre-Dame fire

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Notre-Dame fire

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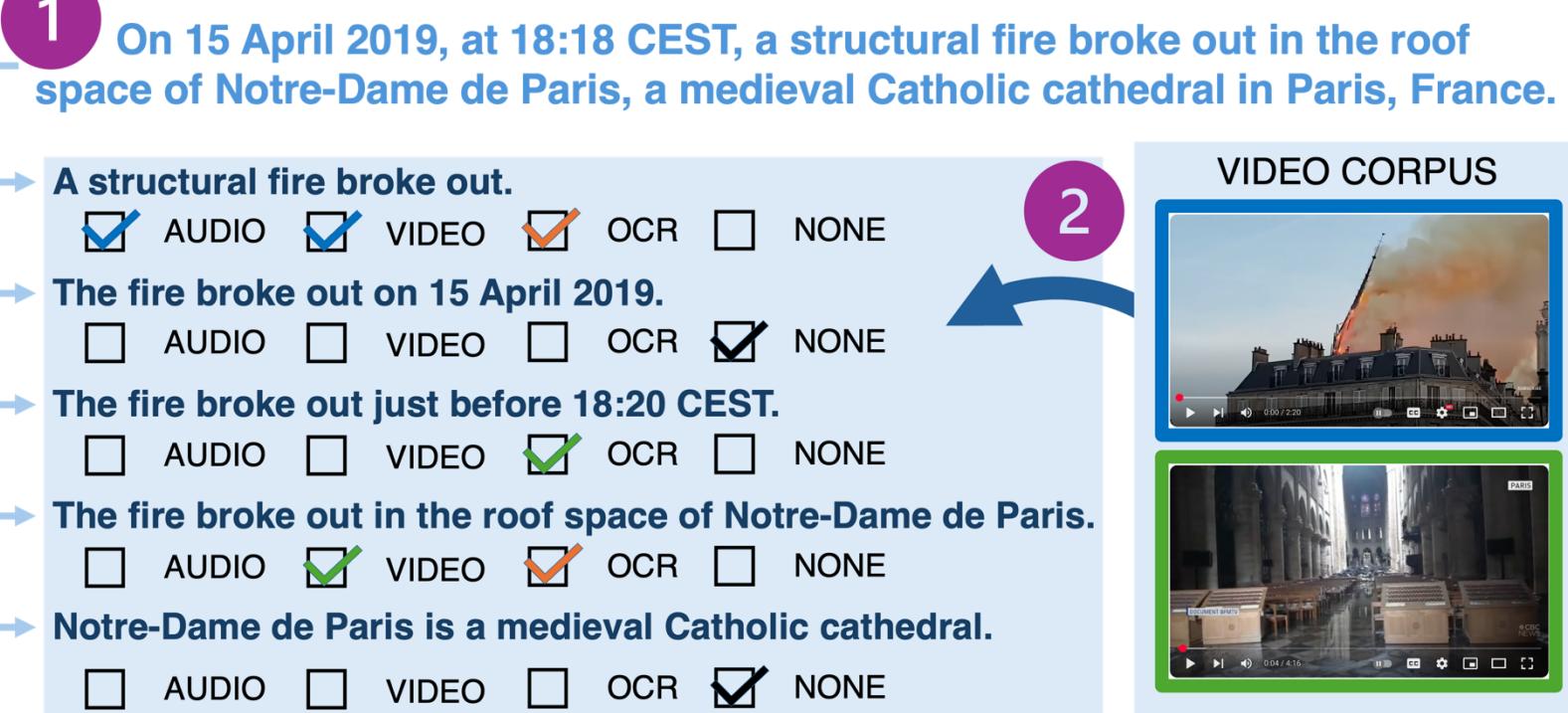
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2

VIDEO CORPUS



3 A structural fire broke out in the roof space of the Notre-Dame de Paris, a medieval Catholic cathedral in Paris, France. By the time the fire was extinguished, the cathedral's wooden spire, called a *fleche*, collapsed, most of the wooden roof had been destroyed, and the cathedral's upper walls were severely damaged. Extensive damage...

WikiVideo: VideoLLM Performance

QwenVL2.5 Output

The video depicts a catastrophic fire engulfing a historic cathedral, likely Notre-Dame in Paris, France. The flames are intense and widespread, with thick smoke billowing into the sky. The iconic spire of the cathedral is visibly on fire, with the structure glowing red from the heat. As the fire rages, the spire begins to weaken and eventually collapses, sending a cascade of debris downward. The surrounding buildings and trees are partially obscured by the smoke, emphasizing the scale and severity of the blaze. The scene is both dramatic and tragic, capturing a moment of significant destruction to a beloved landmark.

WikiVideo: VideoLLM Performance

Recognizes
key entities

QwenVL2.5 Output

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WikiVideo: VideoLLM Performance

Recognizes the underlying event ‘fire’



QwenVL2.5 Output

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WikiVideo: VideoLLM Performance

Recognizes
key subevents

QwenVL2.5 Output

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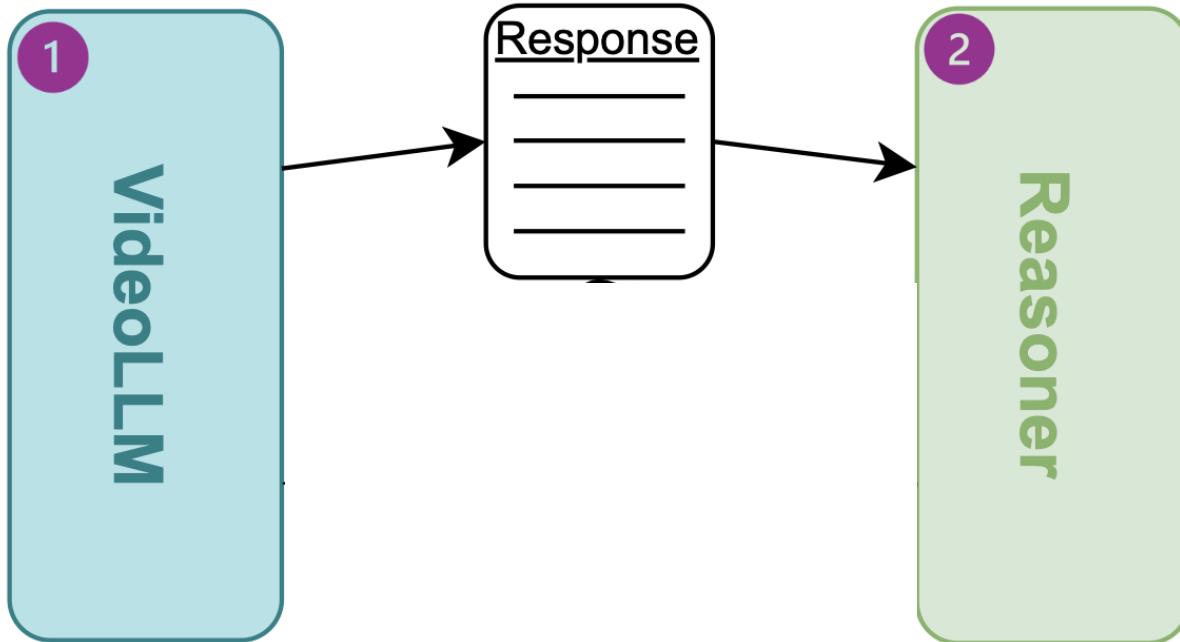
WikiVideo: VideoLLM Performance

QwenVL2.5 Output

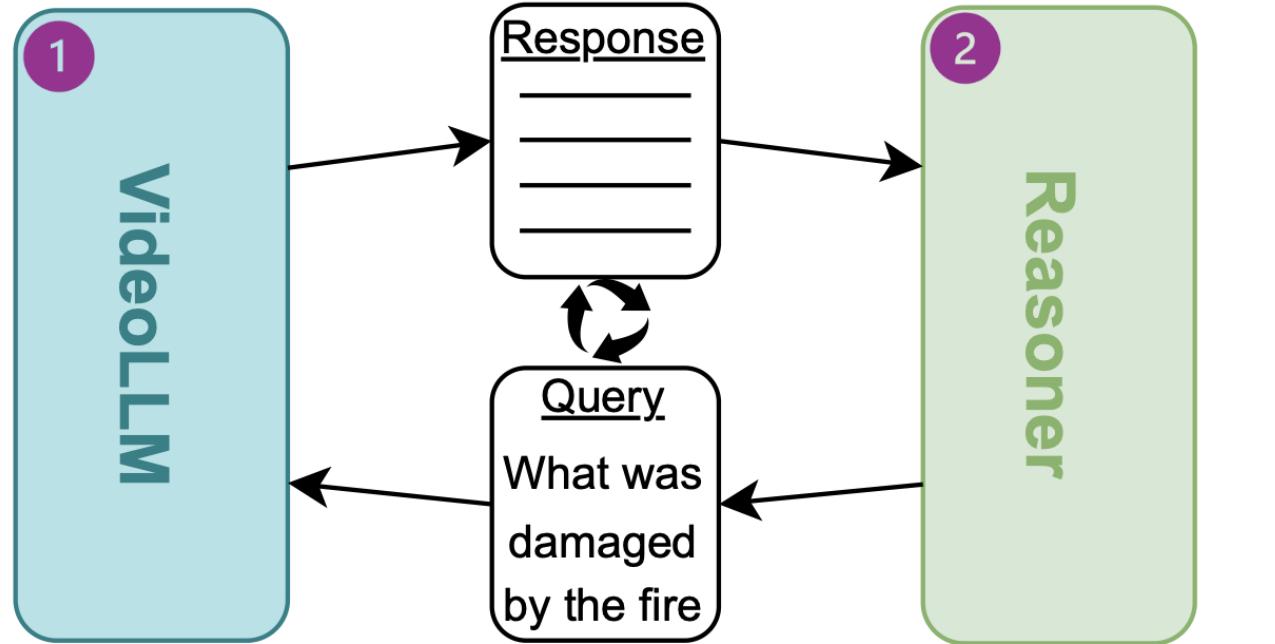
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FAILS TO DRAW “HIGHER-LEVEL” INFERENCES

WikiVideo: Collaborative Article Generation

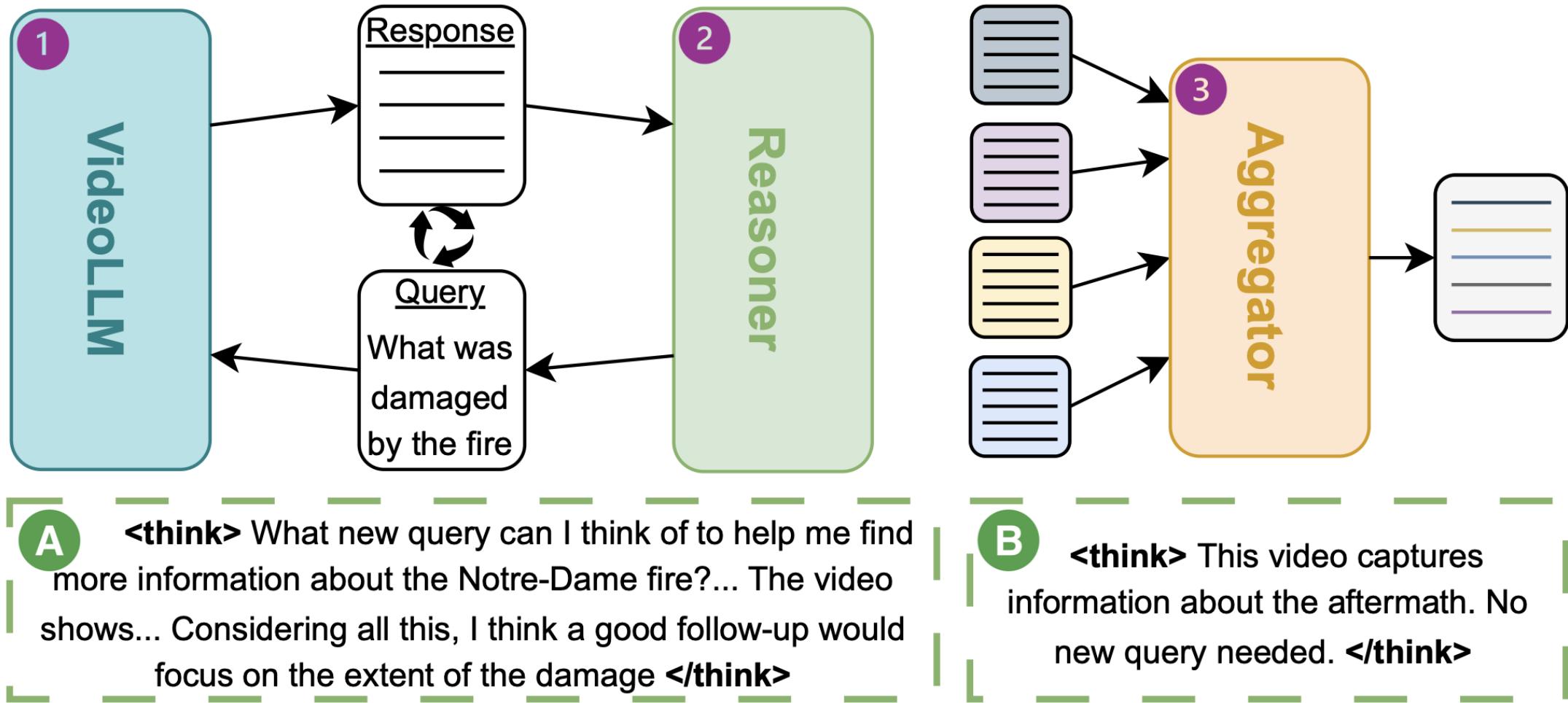


WikiVideo: Collaborative Article Generation

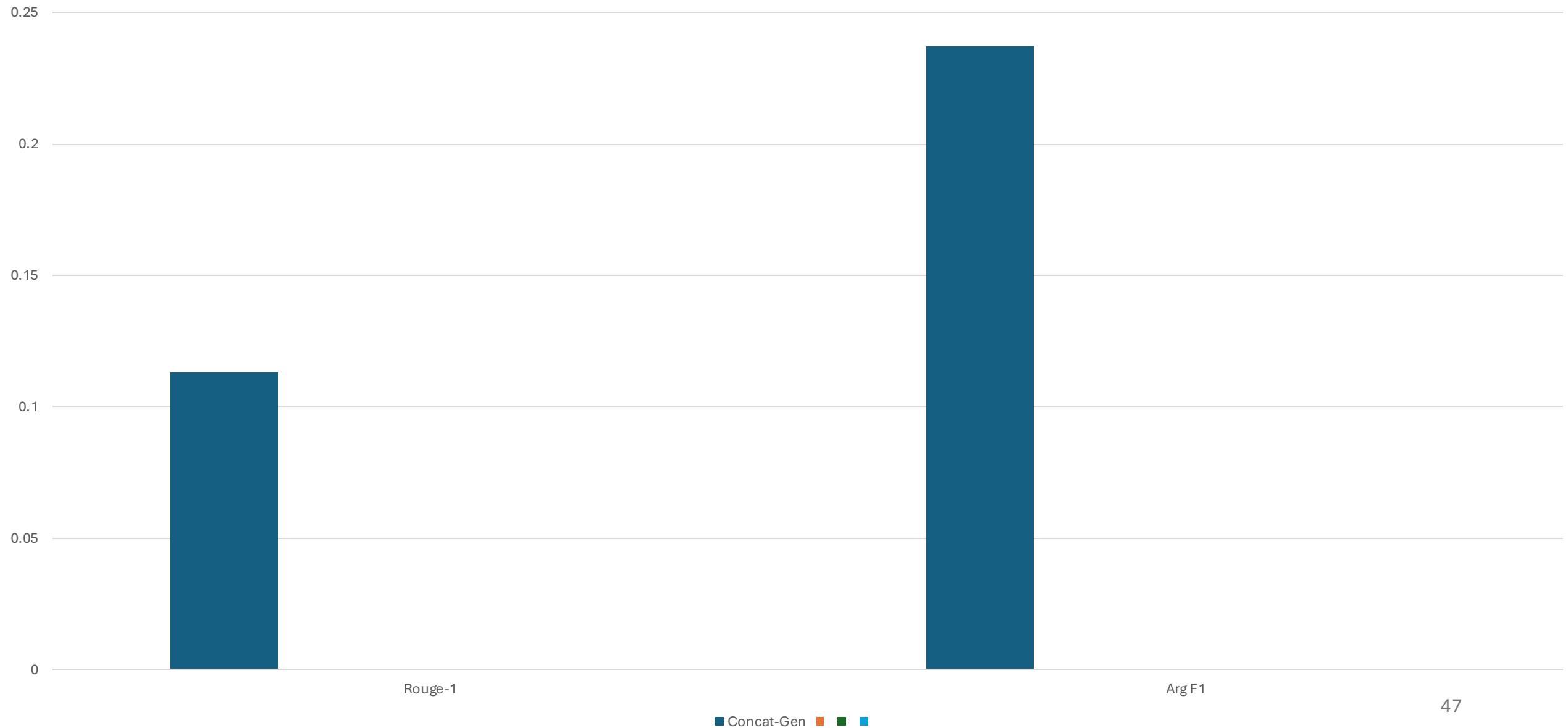


A <think> What new query can I think of to help me find more information about the Notre-Dame fire?... The video shows... Considering all this, I think a good follow-up would focus on the extent of the damage </think>

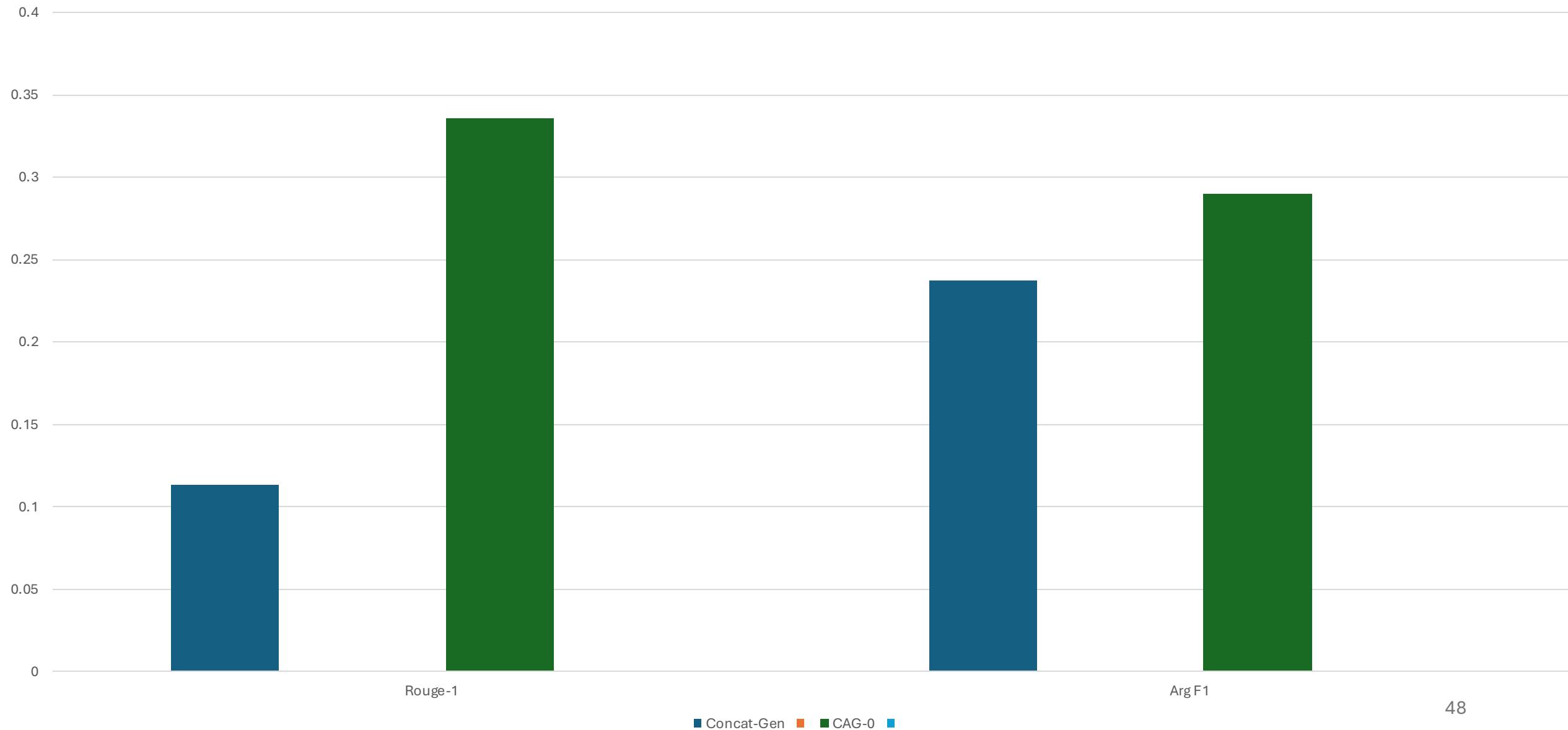
WikiVideo: Collaborative Article Generation



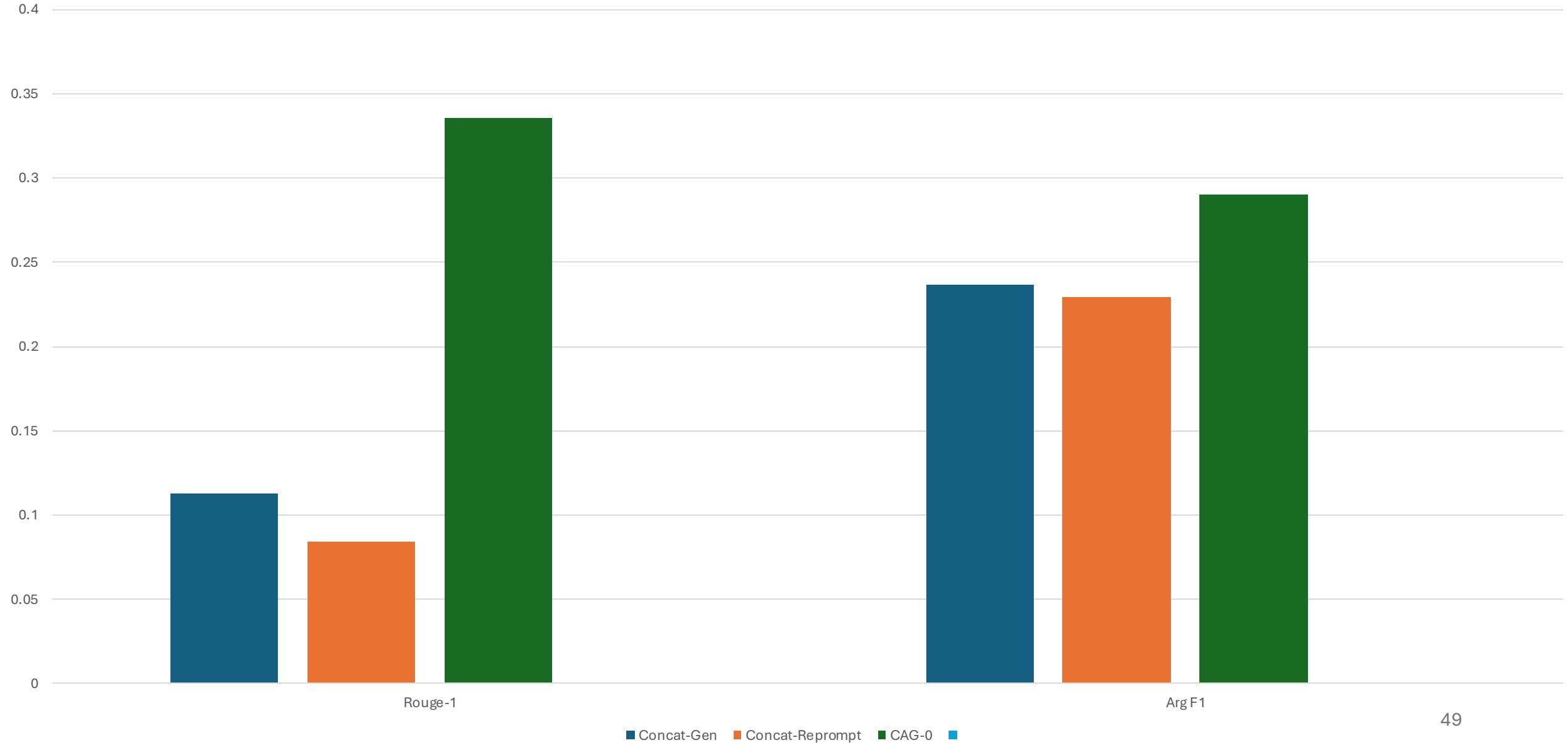
WikiVideo: Results



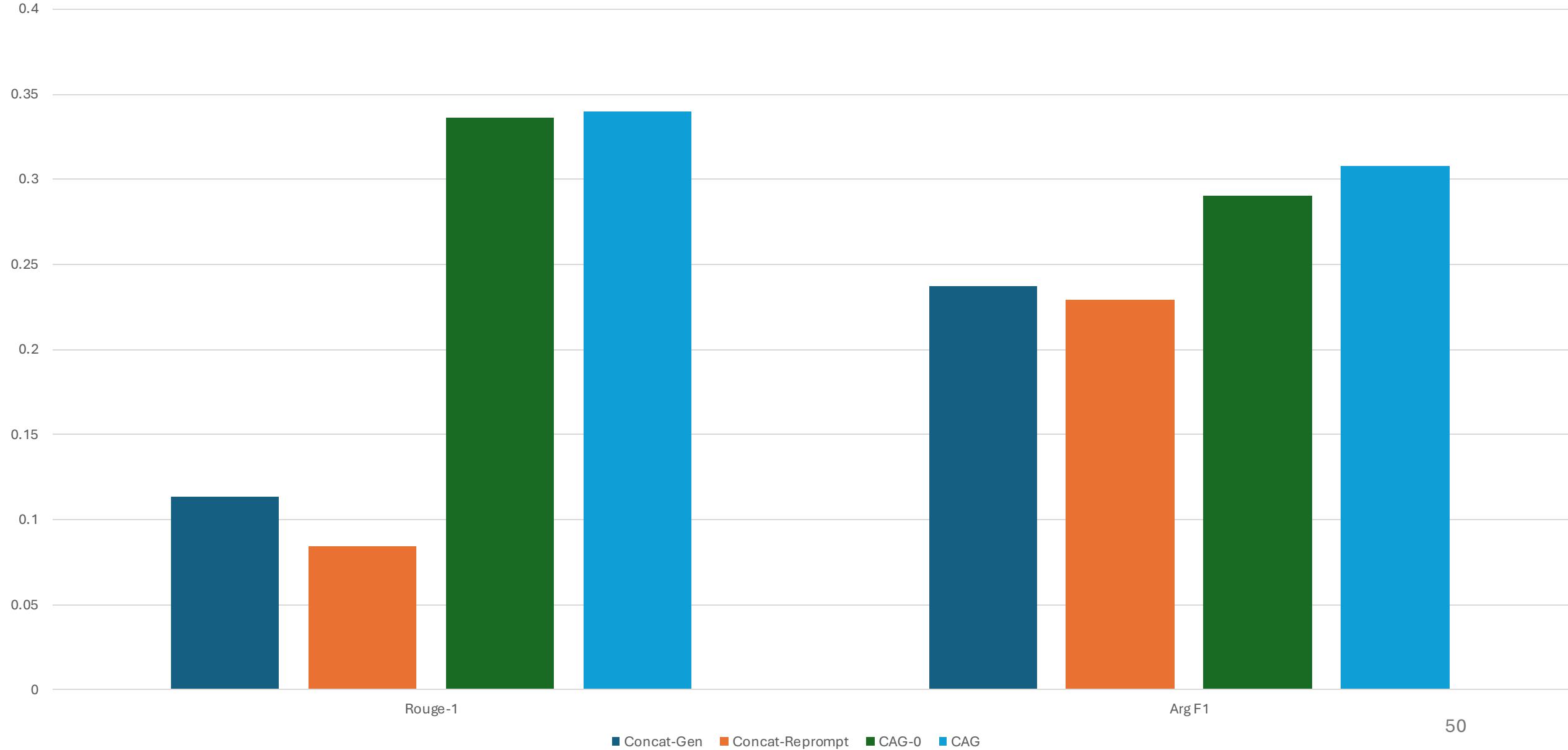
WikiVideo: Results



WikiVideo: Results



WikiVideo: Results



WikiVideo: CAG-2 Output

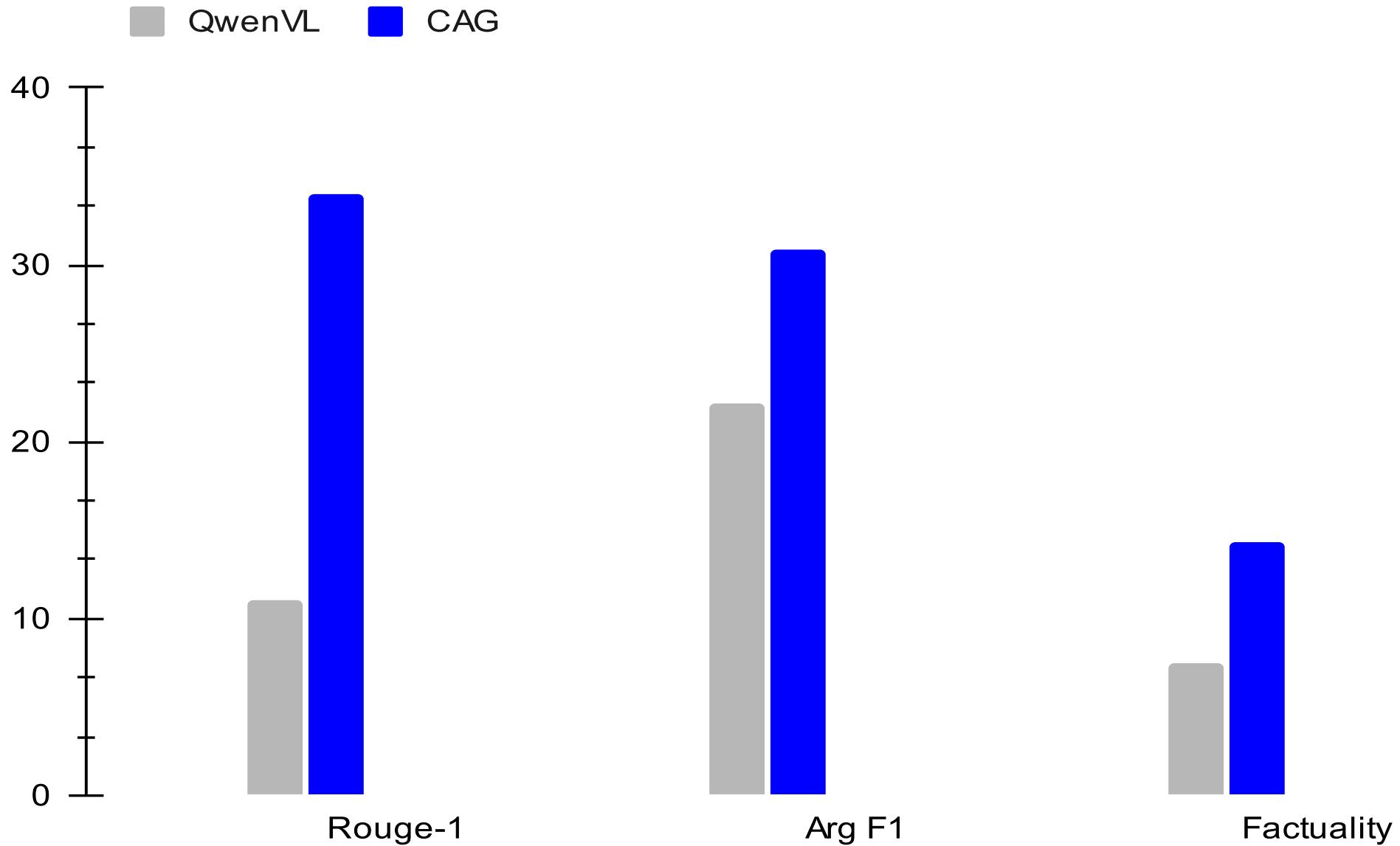
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WikiVideo: CAG-2 Output

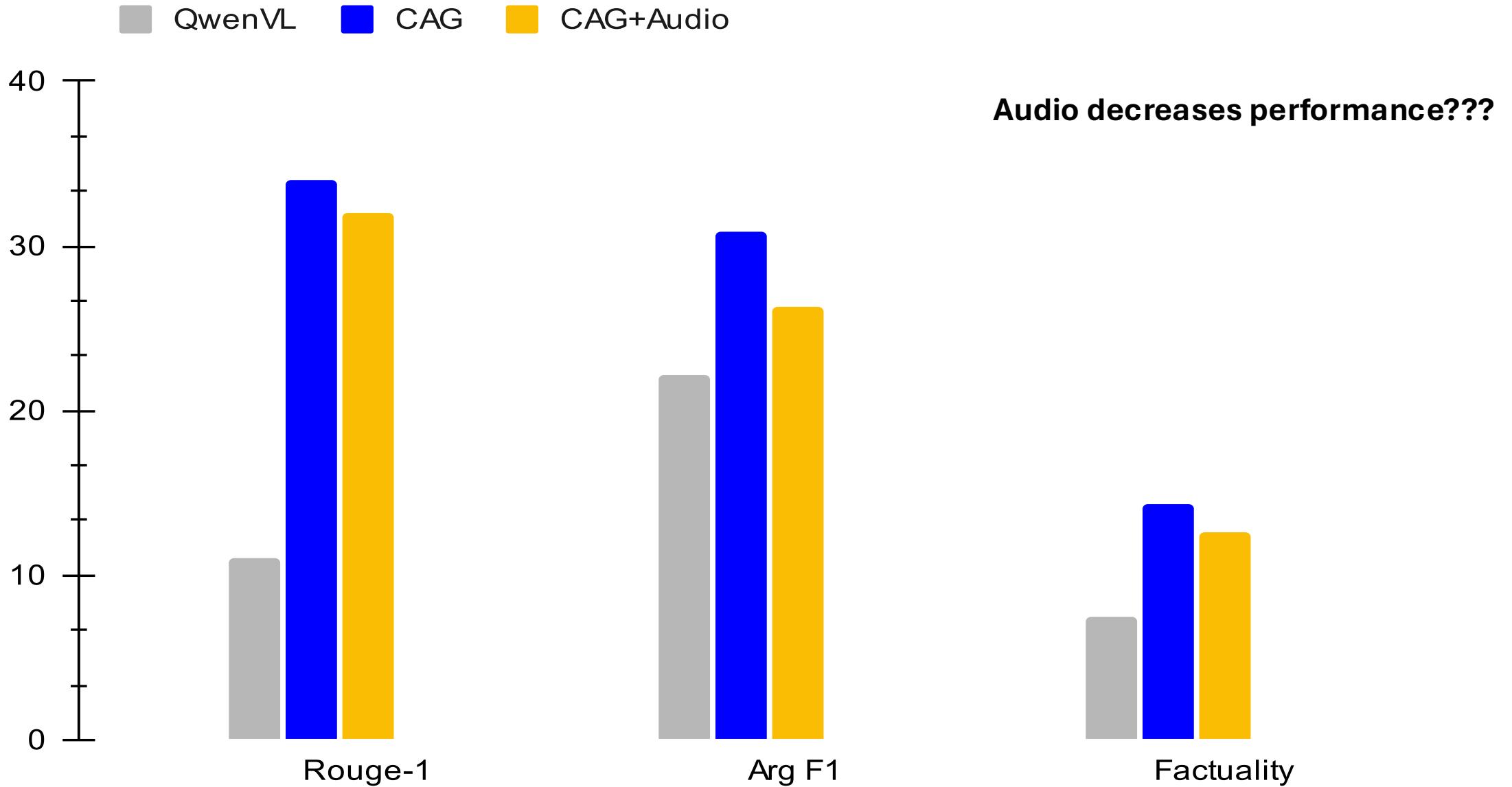
BOLD = NOT IN THE VIDEO CONTENT

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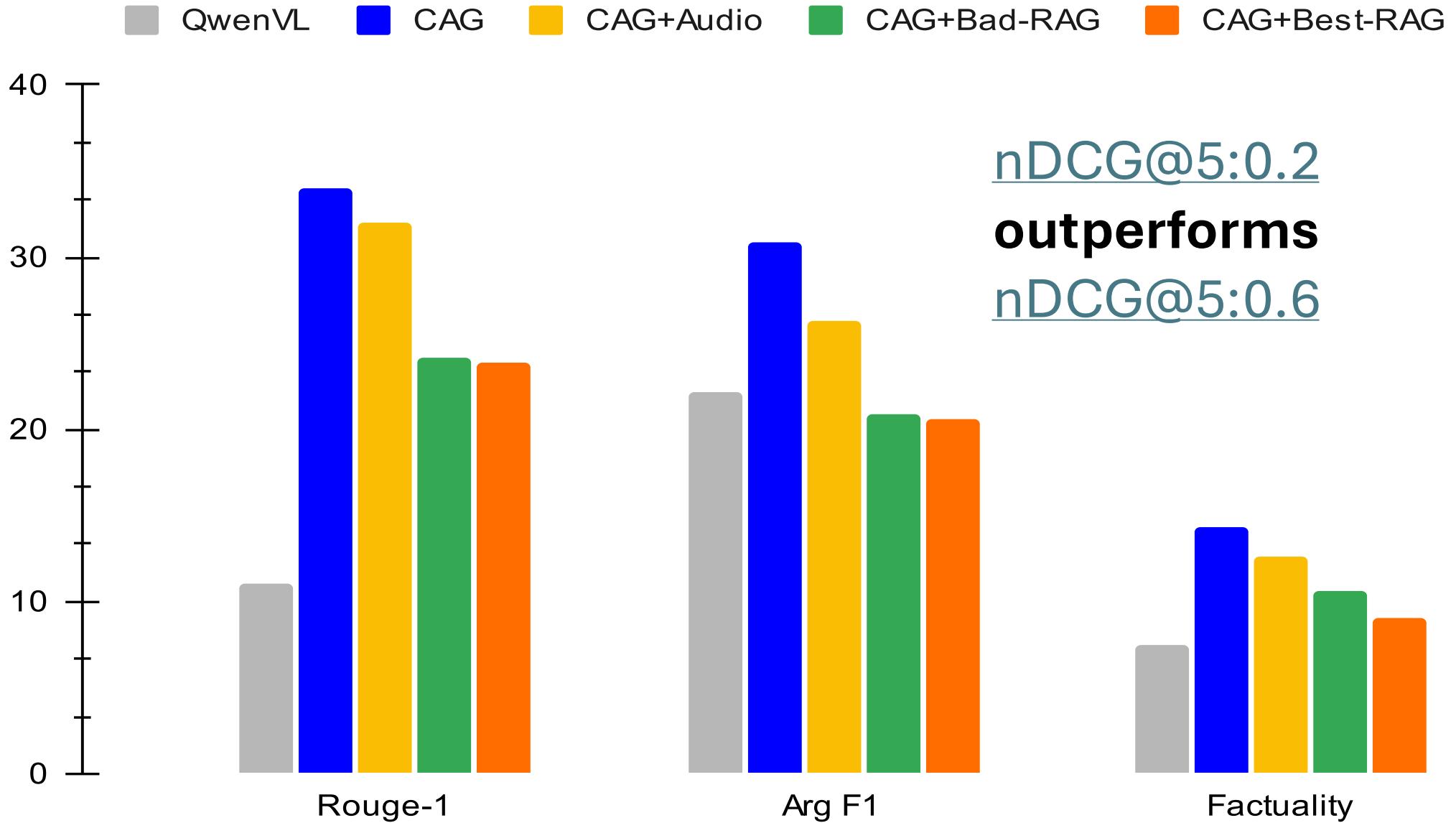
Results



Results



Results



Video-ColBERT



WikiVideo



MultiVENT



nlp.jhu.edu/multivent/

ACL Workshop on
Multimodal RAG



nlp.jhu.edu/magmar/