

ClipMind: A Framework for Auditing Short-Format Video Recommendations Using Multimodal AI Models



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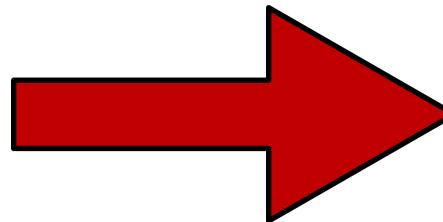
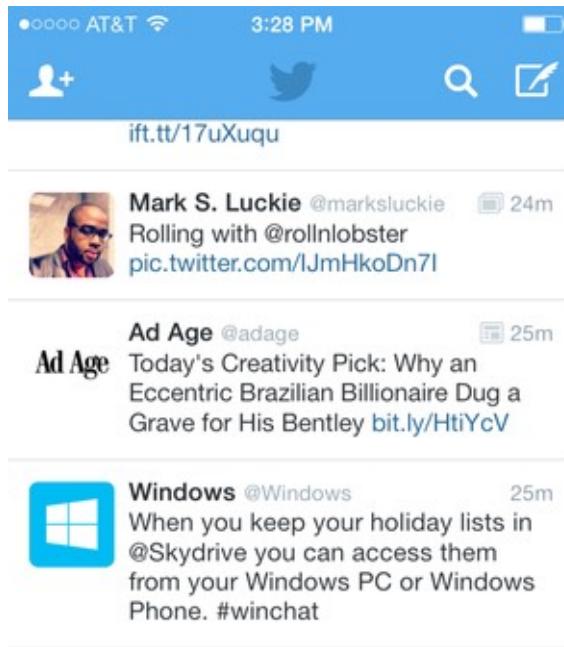


TU Delft
Savvas Zannettou

Significant Shifts in Social Media Platforms

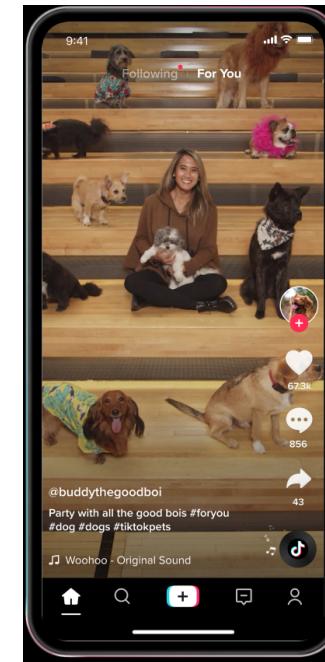
Social network-based feed:

- Based on user connections



Algorithmic Social Media feed:

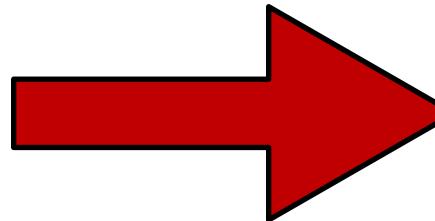
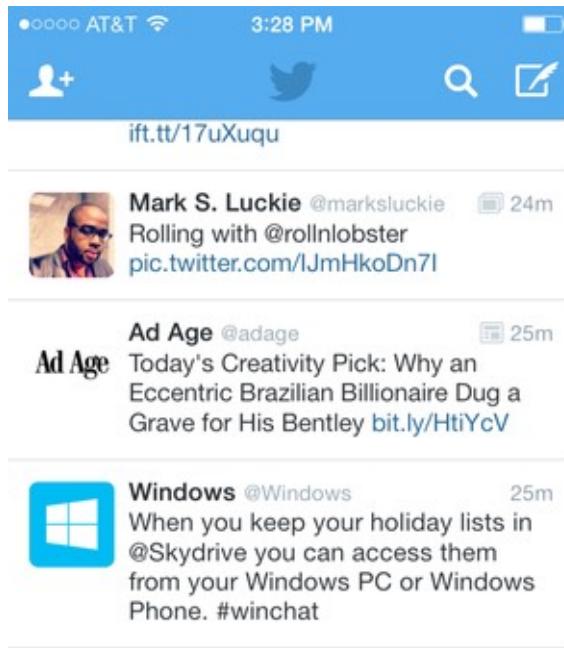
- Algorithmically curated and ordered



Significant Shifts in Social Media Platforms

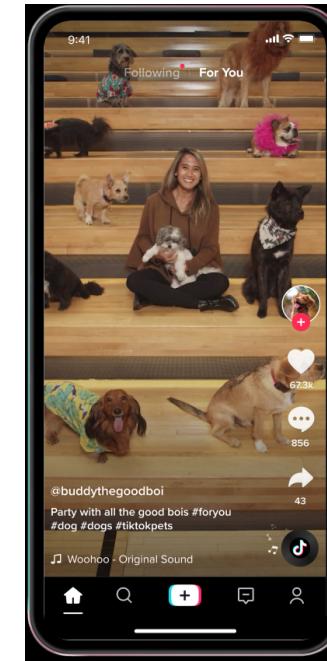
Social network-based feed:

- Based on user connections



Algorithmic Social Media feed:

- Algorithmically curated and ordered



In addition to recommendation algorithms, shift towards content that is in the form of short-format videos

Potential Issues with Short-Format Video Recommendations



Recommendation of extreme content
Ribeiro et al. (2020) found evidence of user radicalization pipelines on YouTube



Leading users towards polarizing rabbit holes
Wall Street Journal Investigation on TikTok showing that 93% of the videos related to depression

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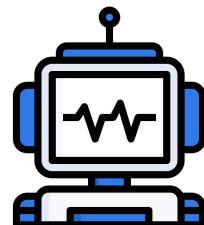
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Pressing need for computational methods to analyze
and audit algorithmic recommendations

ClipMind in a Nutshell!

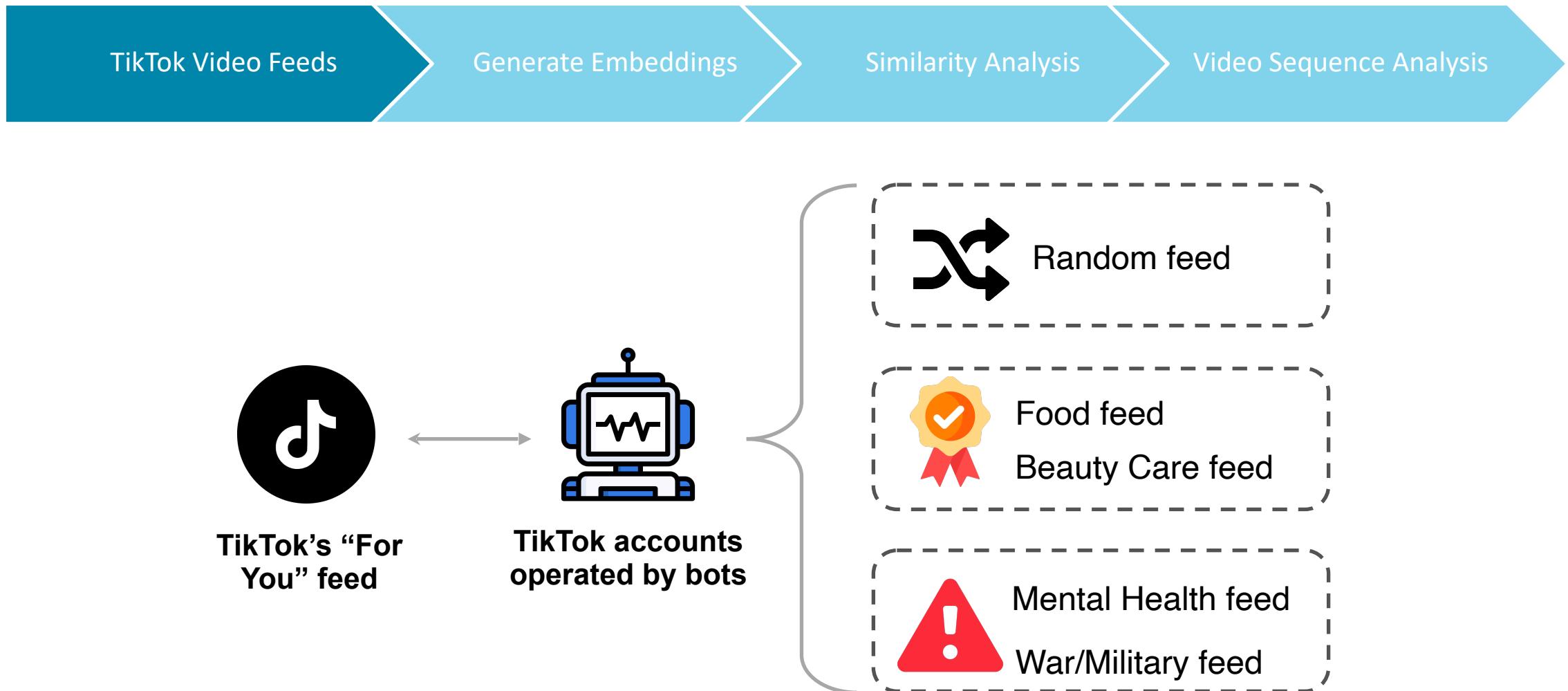


TikTok's "For You" feed



TikTok accounts operated by bots

ClipMind in a Nutshell!



ClipMind in a Nutshell!



ImageBind

Video visual and audio content → **embedding**

Video-LLaMA



LLM-generated video description → **text**



GPT-4

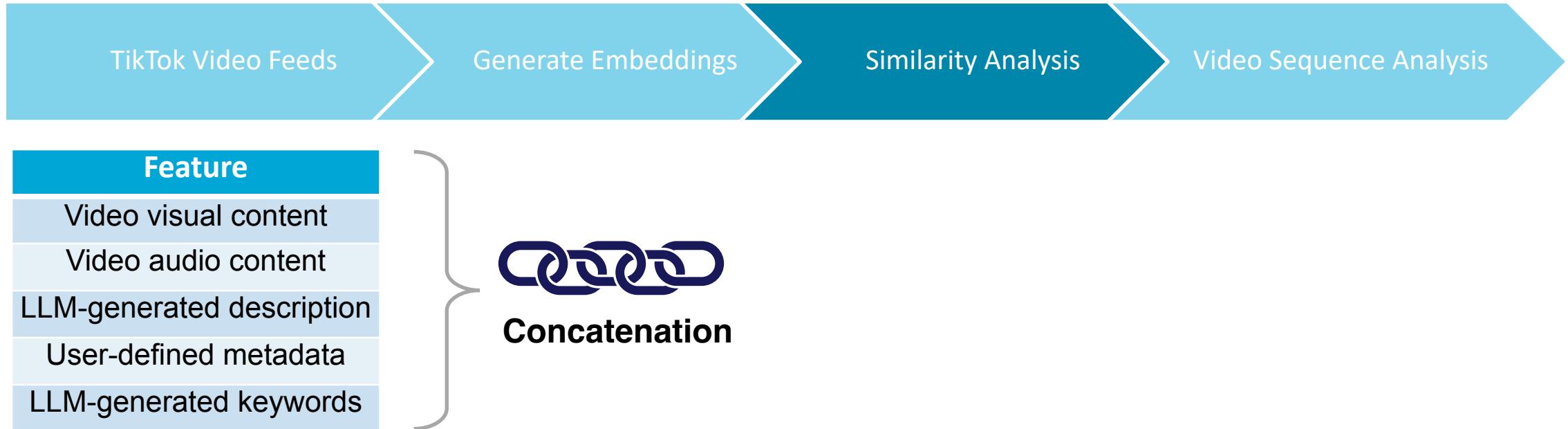
LLM-generated video keywords → **text**



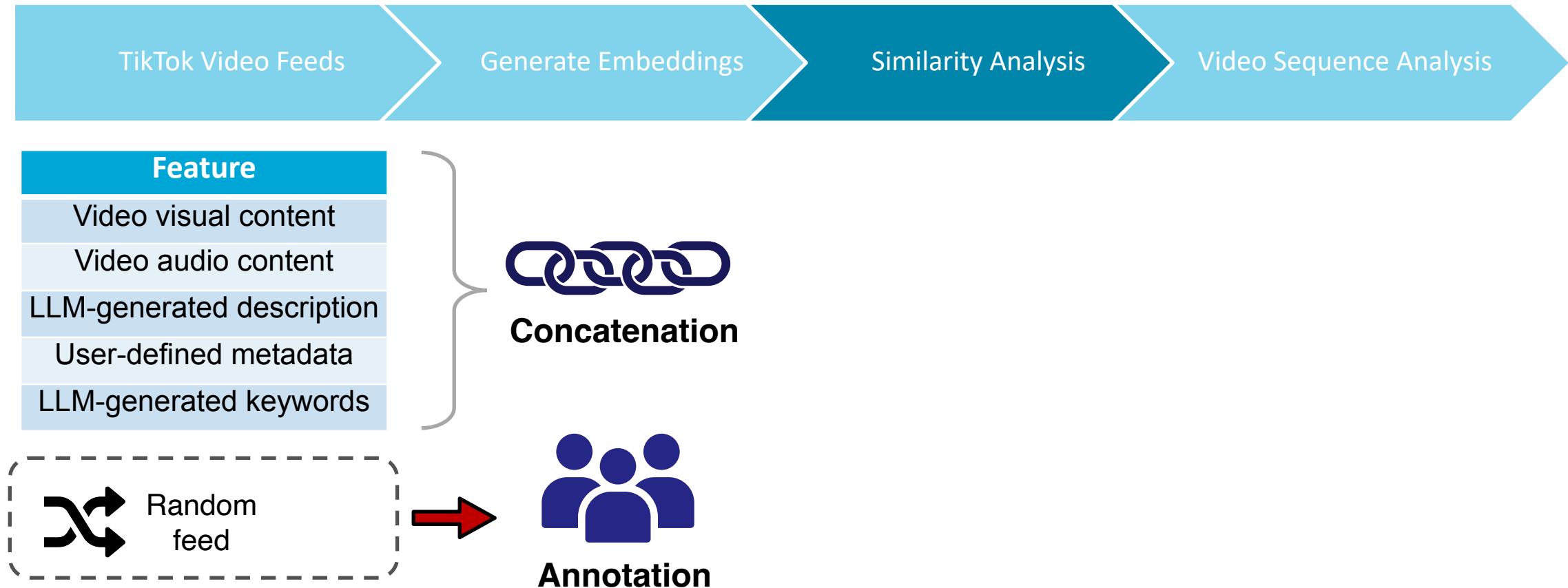
ADA-002

Textual content → **embedding**

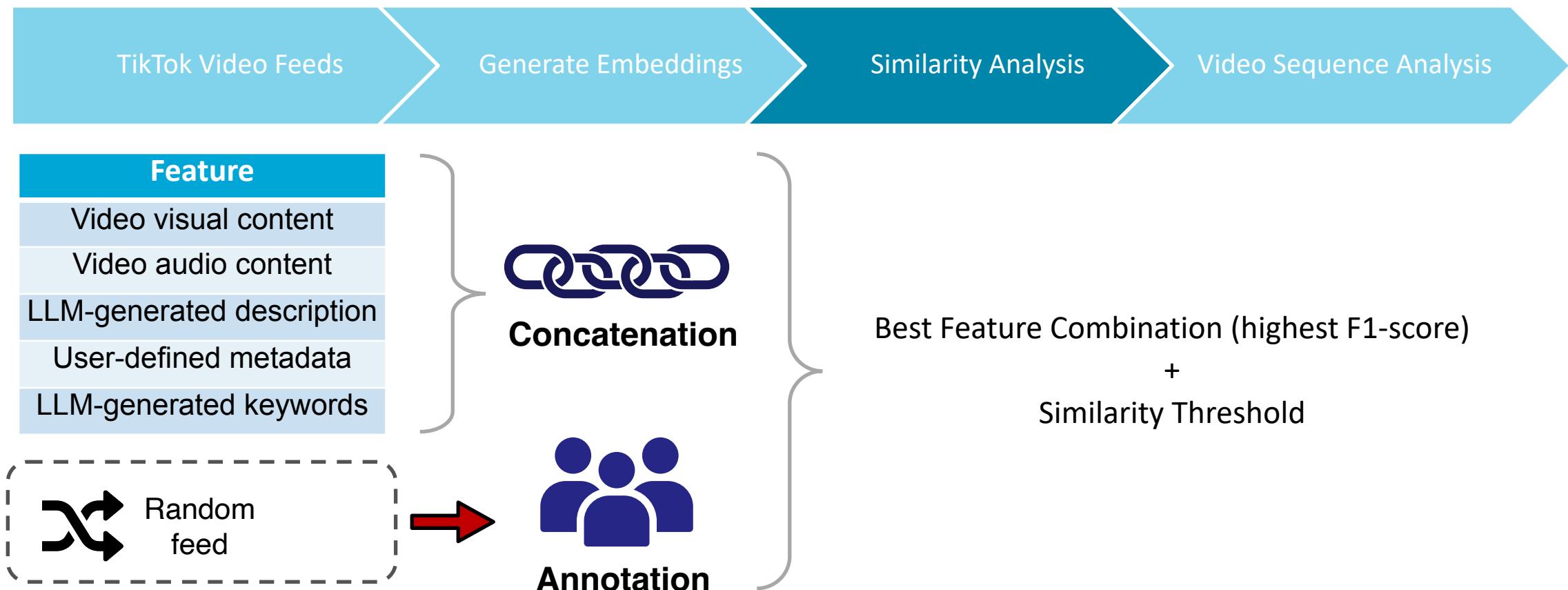
ClipMind in a Nutshell!



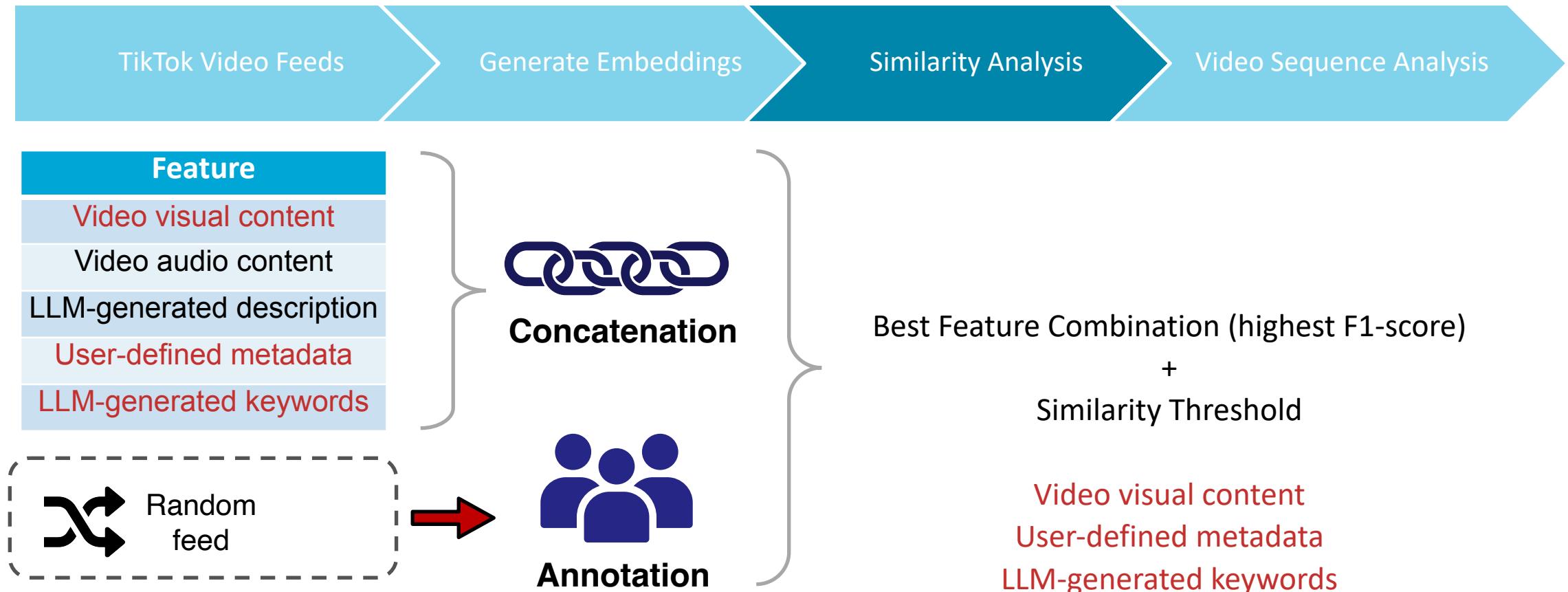
ClipMind in a Nutshell!



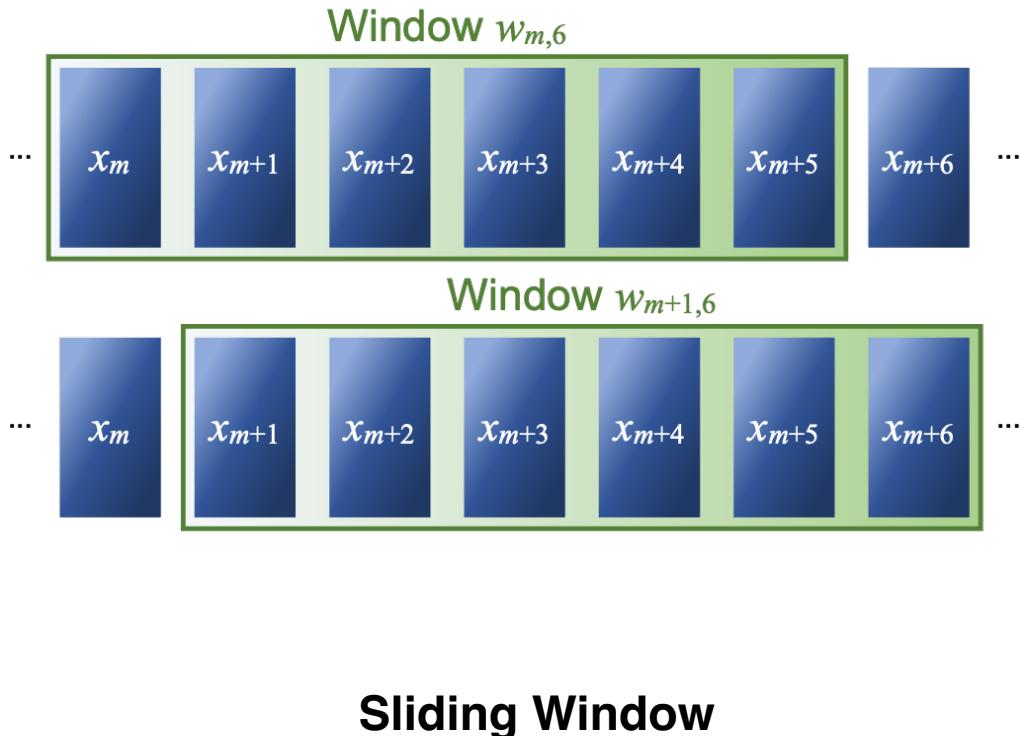
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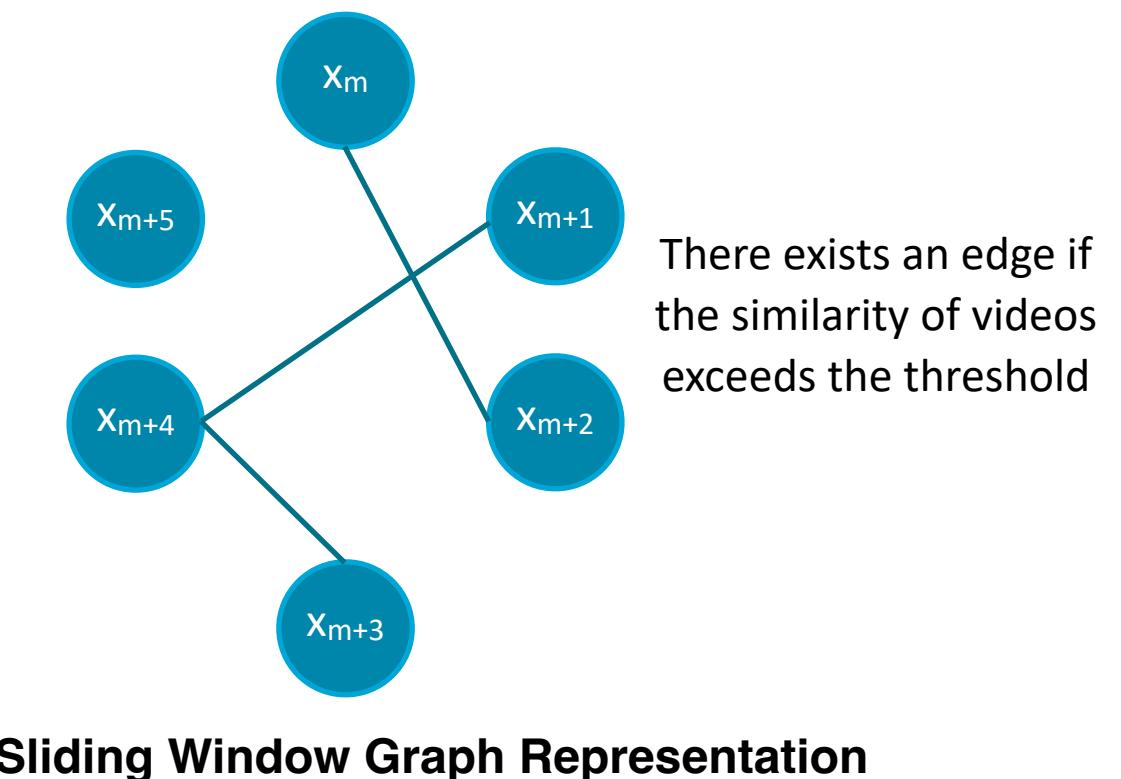
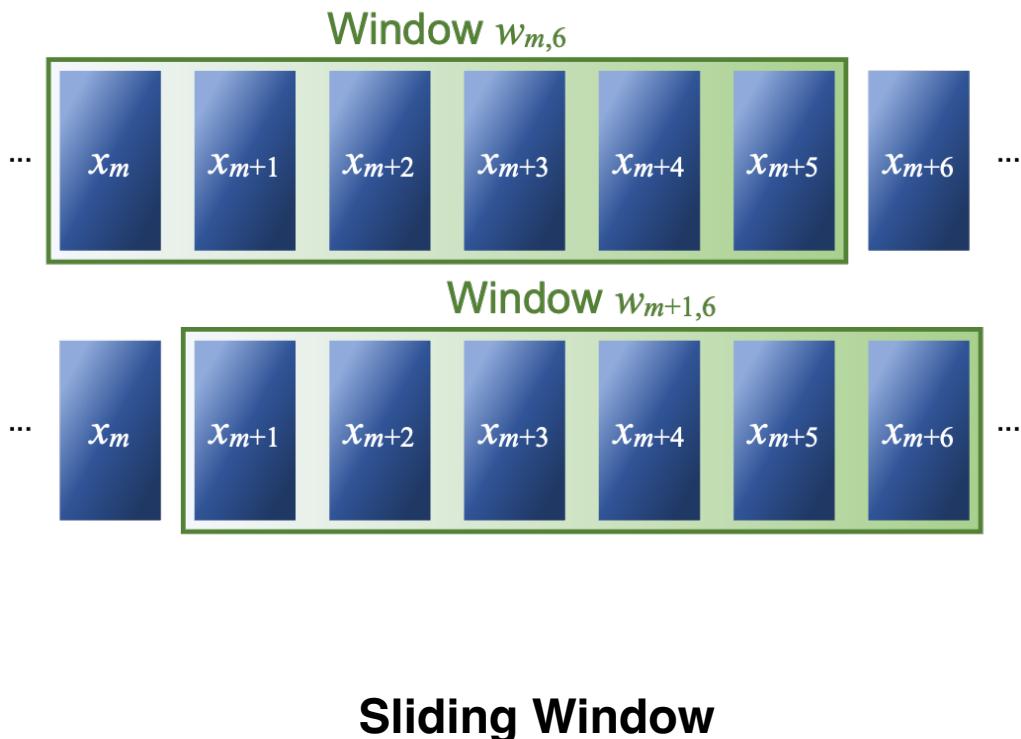
ClipMind in a Nutshell!



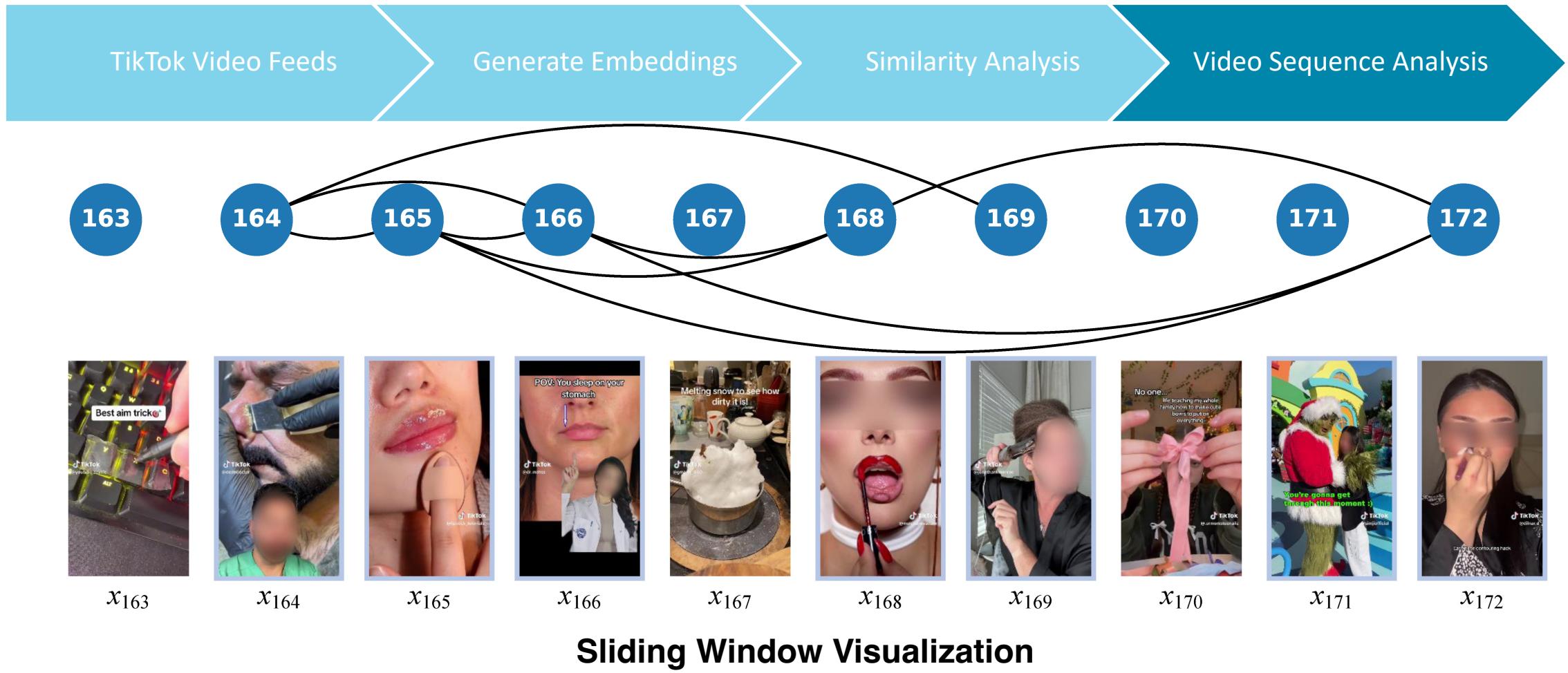
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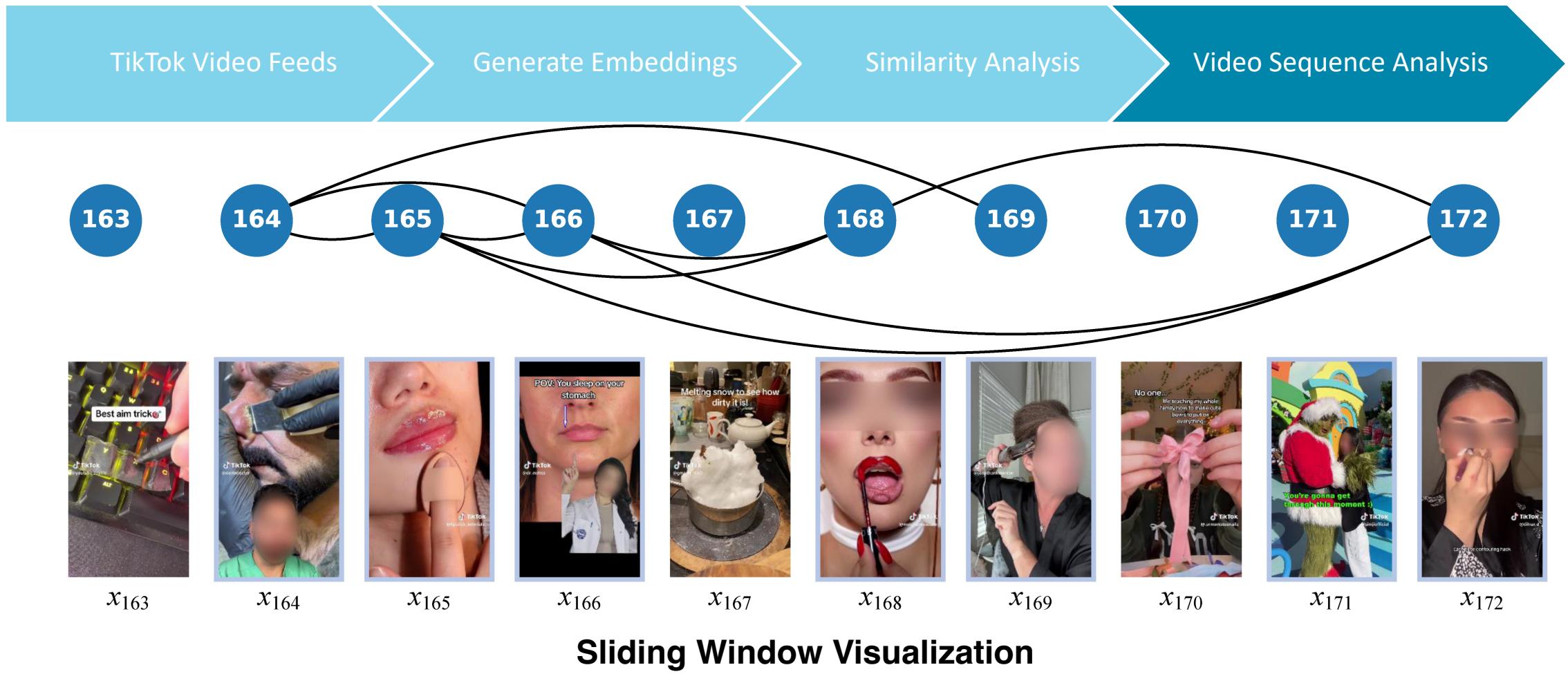
ClipMind in a Nutshell!



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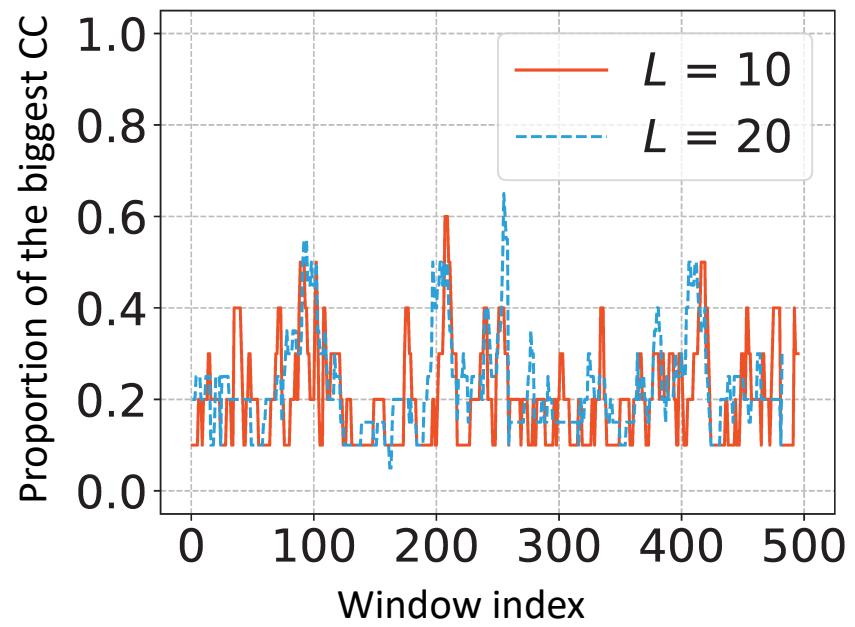


ClipMind in a Nutshell!



Big connected components (CC) might be signs of informational rabbit holes!

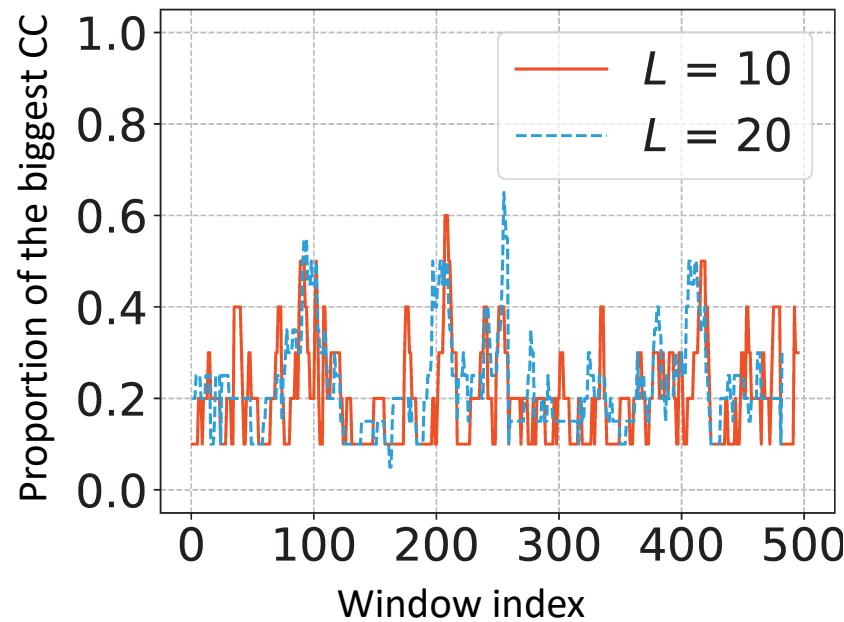
Main Findings



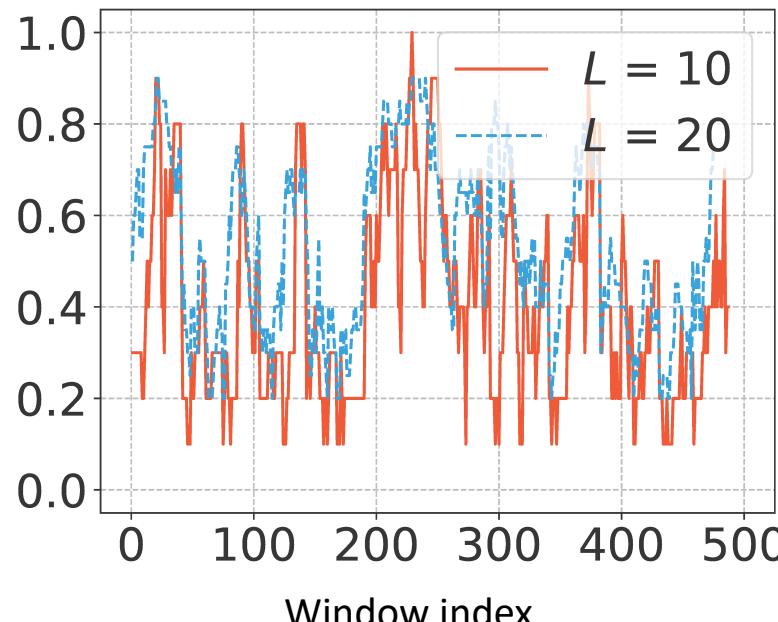
Random feed

Main Findings

Informational
rabbit hole observed for
mainstream topic

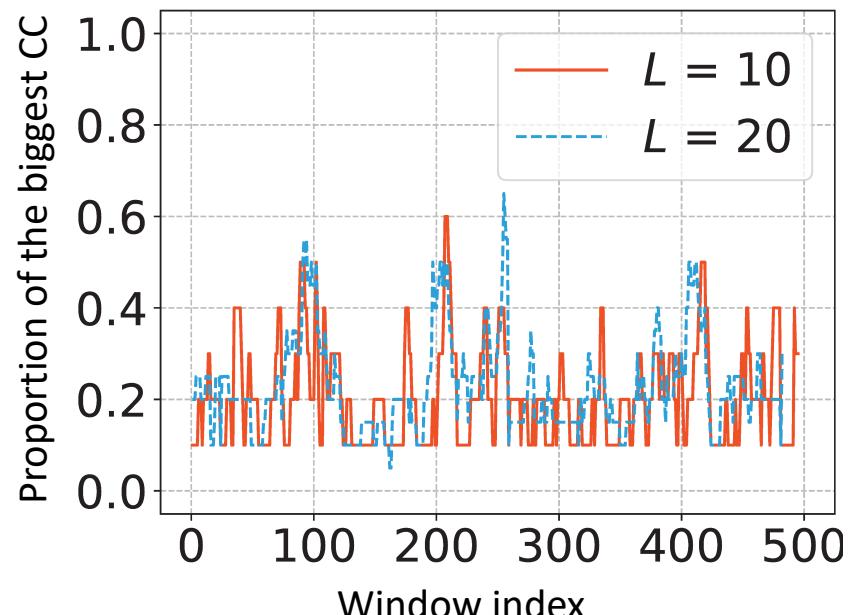


Random feed

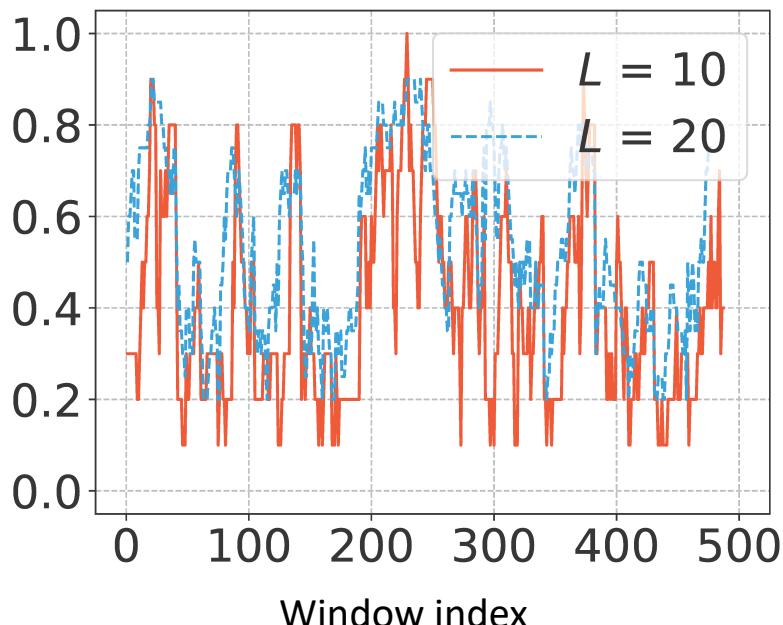


Food feed

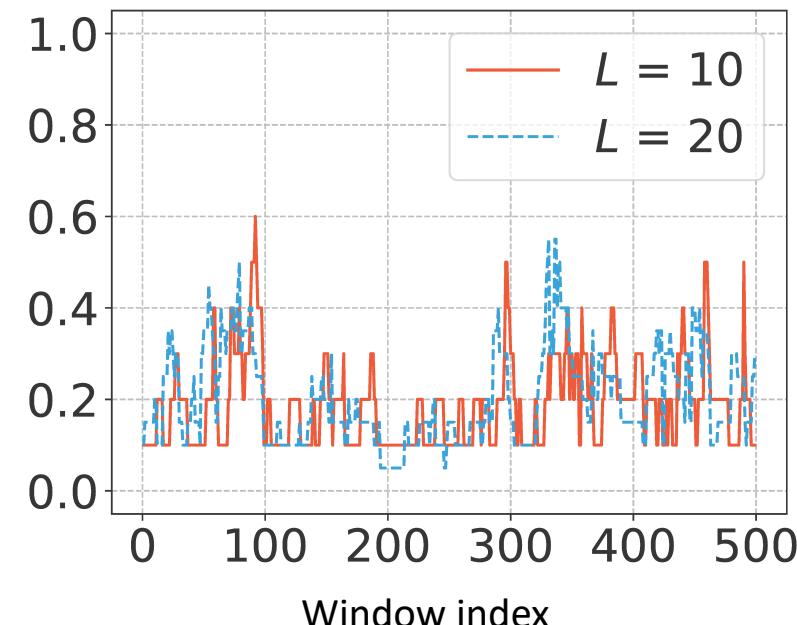
Main Findings



Random feed



Food feed



Mental Health feed

Informational
rabbit hole observed for
mainstream topic

No evidence of
informational rabbit holes of
extreme content

Conclusion



ClipMind: A *scalable, modular, and generalizable* framework for auditing short-format videos



ClipMind in practice: TikTok algorithm steers users into informational rabbit holes of mainstream topics, but we observe no such thing for extreme content



ClipMind publicly available, try it out!

