

Livestreaming

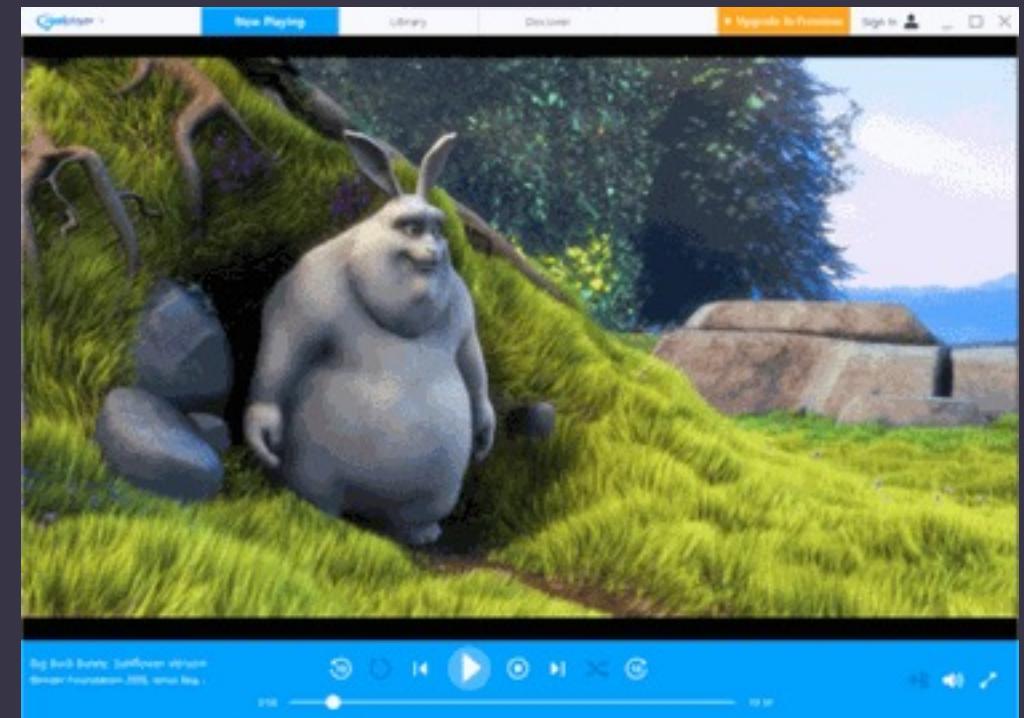
Kenneth Pat
INF 251 – Spring 2024

Today's Agenda

- Learn about the history and market of live streaming (~20 min)
- Discuss how stream communities form and grow on Twitch (Paper 1) (~30 min)
- Explain the overall picture of research in live streaming in the fields of HCI and CSCW (Paper 2) (~30 min)

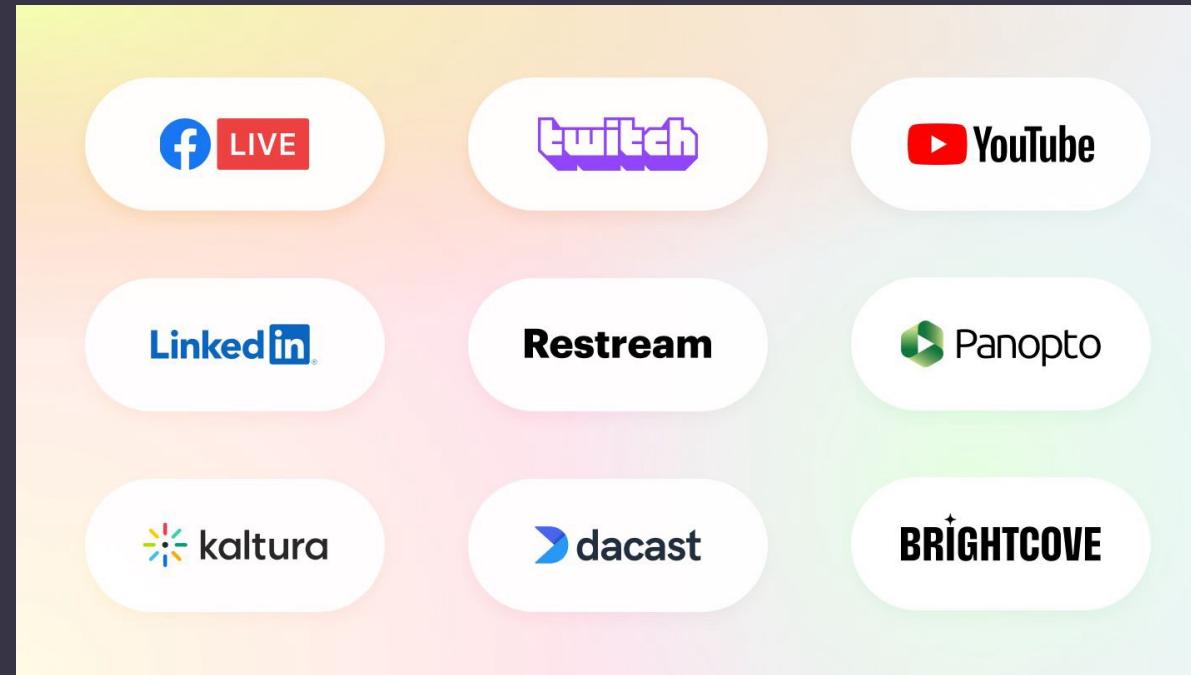
History of live streaming

- Live streaming began in the 90s and is as old as the Internet
- First ever live streams featured music and baseball games
- Broadcasted on RealPlayer (released in 1995 and still updating)



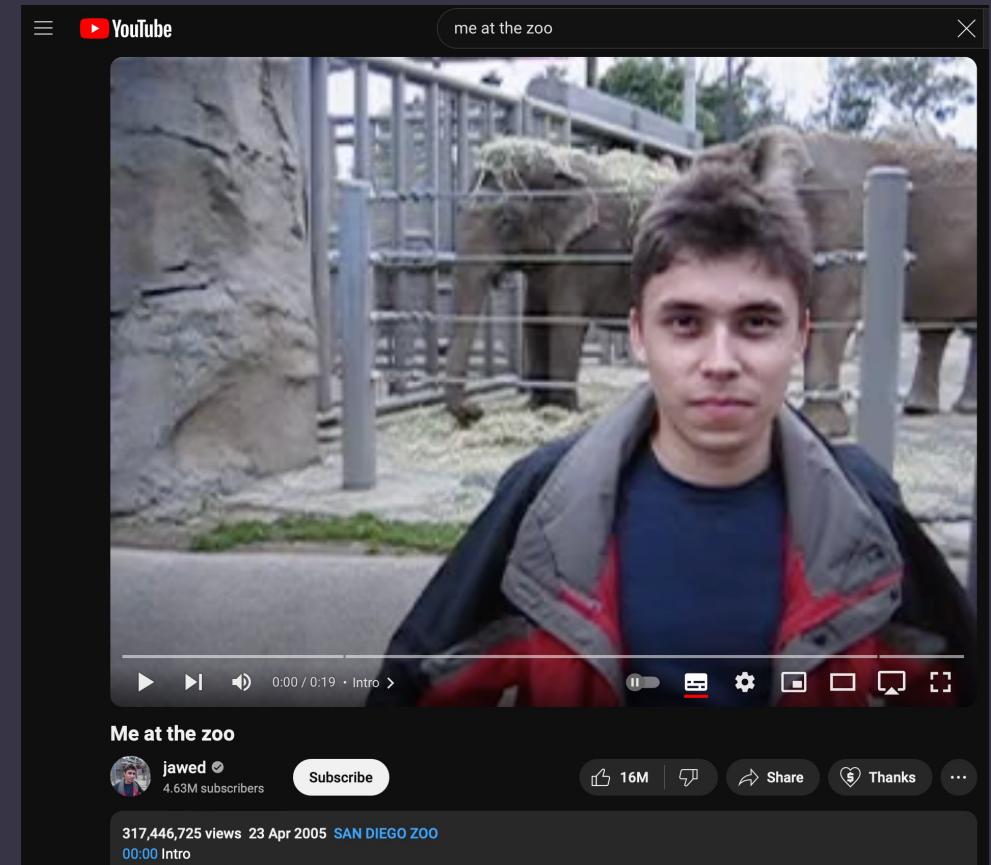
Platforms

- Almost every social media platform support live streaming nowadays (features may vary)
- Social networking services such as Facebook, Twitter / X, and LinkedIn added live streaming features in 2010s
- Reddit shut down their live streaming features in Nov 2022



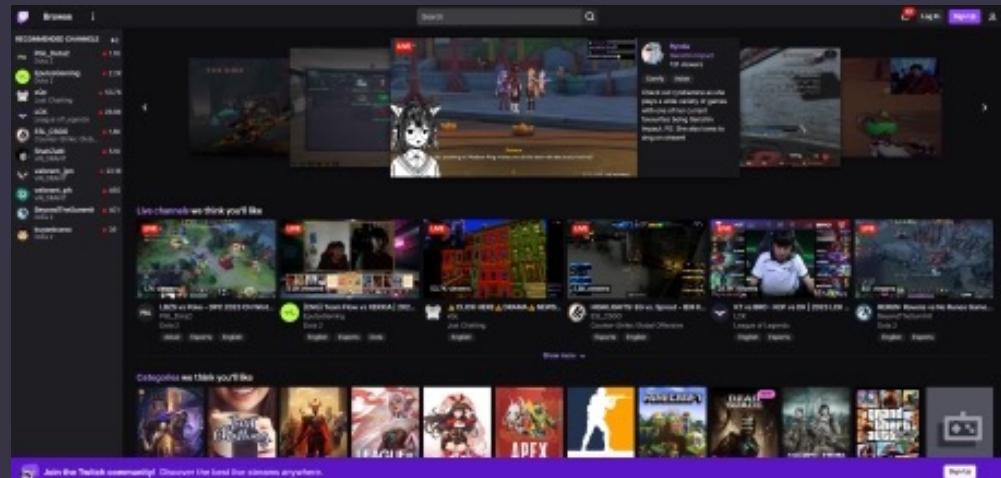
YouTube

- 2nd most visited website in the world
- Founded in Feb 2005
- First video uploaded on Apr 23, 2005, titled “Me at the zoo”
- First slogan: “Broadcast Yourself”
- Purchased by Google in Oct 2006 for US\$1.65B



Twitch

- 38th most visited website in the world
 - Founded in Jun 2011
 - Focuses specifically on video game streaming
 - Broadcasts various esport competitions
 - Acquired by Amazon in Aug 2014 for US\$970M



Discussion 1

Why do you think more social media have added live streaming features to their platforms? What does it suggest in terms of consumer needs?

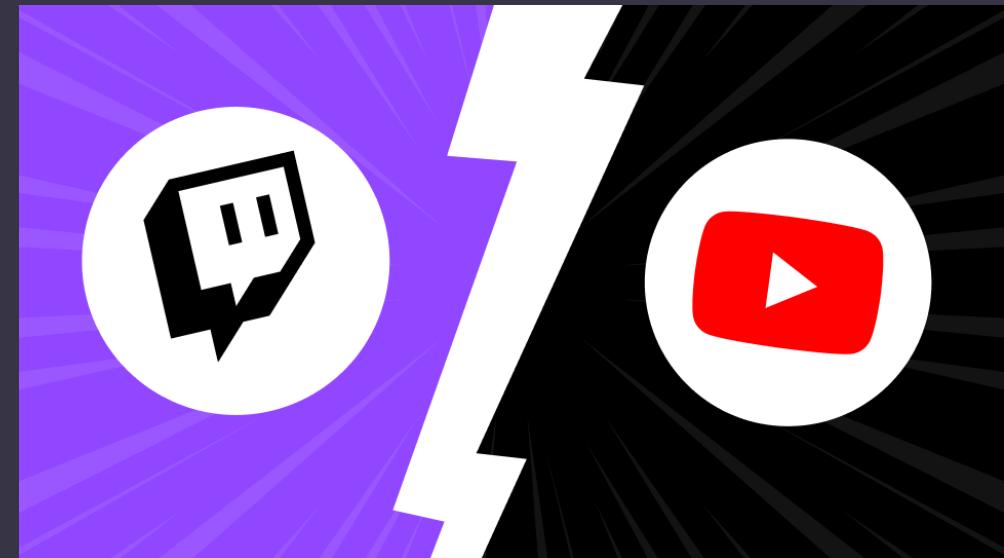
How streamers earn money

Twitch

- 50/50 revenue split
- Ads
- Subscriptions
- Bits (fan donations)

YouTube

- 70/30 revenue split
- Ads
- Super Chats
- Super Thanks
- Memberships
- YouTube shopping



Different types of streamers



- Traditional YouTubers
- Focus more on things in real life
- Use their real faces on streams
- Have full control on their topics
- Have full ownership of their content
- More independent
- **MrBeast** is the most subscribed YouTuber
- Has 253M subscribers



- Virtual YouTubers (a.k.a. Vtubers)
- Tend to be anonymous
- Use virtual avatars on streams. Not allowed to show real faces
- Topics are determined by company policies and/or management staff
- Usually do not have full ownership on their avatars or content
- **Gawr Gura** is the most subscribed Vtuber
- Has 4.45M subscribers
- More dependent, usually belong to agencies

Discussion 2

Who do you think the target audience of traditional YouTubers and Vtubers are? Why do you think there's a trend on Vtubers?



Streaming on Twitch: Fostering Participatory Communities of Play within Live Mixed Media

Authors: William A. Hamilton, Oliver Garretson, Andruid
Kerne

Published at CHI 2014

Overview

- Discussed how live streaming fostered participation and community
- Examined the components of a Twitch stream and the significance of the Internet Relay Chat (IRC) channel
- Introduced the concept of “Third Places”

Components of a stream

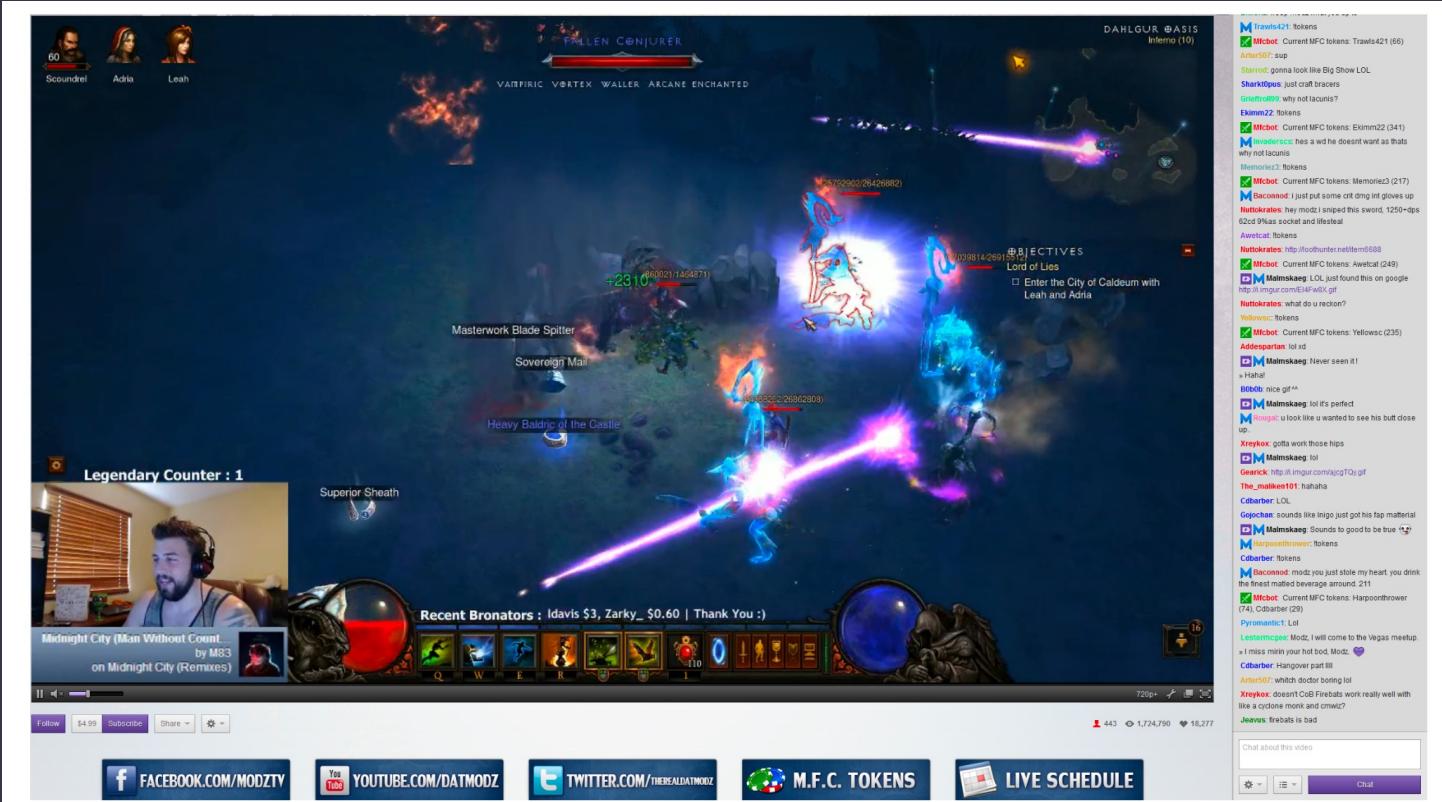


Figure 1. Twitch streams enable streamers to broadcast high-fidelity video of gameplay and real-life. Participants simultaneously communicate through streamed media and an associated chat channel (right).

Discussion 3

Why is the chat channel a crucial component of a stream? Why was it chosen to be the preferred medium?

Interaction and emotion

42 Masterwhitewolf: 
Infinitecatalyst: go to schools cars and firehouses
Skyguy342: ok 
42 N25000: wat?
Buddybas: hi johnny
42 N25000: I missed that
X 42 Lordboogzor: Keep the bloodbag and force it on someone you capture 
Internalpain45: hello saciel and Hello CHAT
42 Parallax_: Cherno, Elexctro and Berenzino all have firestations in them, The ship on the east coast has military loot, zelenegorsk and Vybor have military loot, its everywhere Jambop

Figure 2. Every Twitch stream has an embedded chat channel. Twitch uses a custom IRC client with special features for showing stream specific emoticons and denoting stream subscribers and moderators.

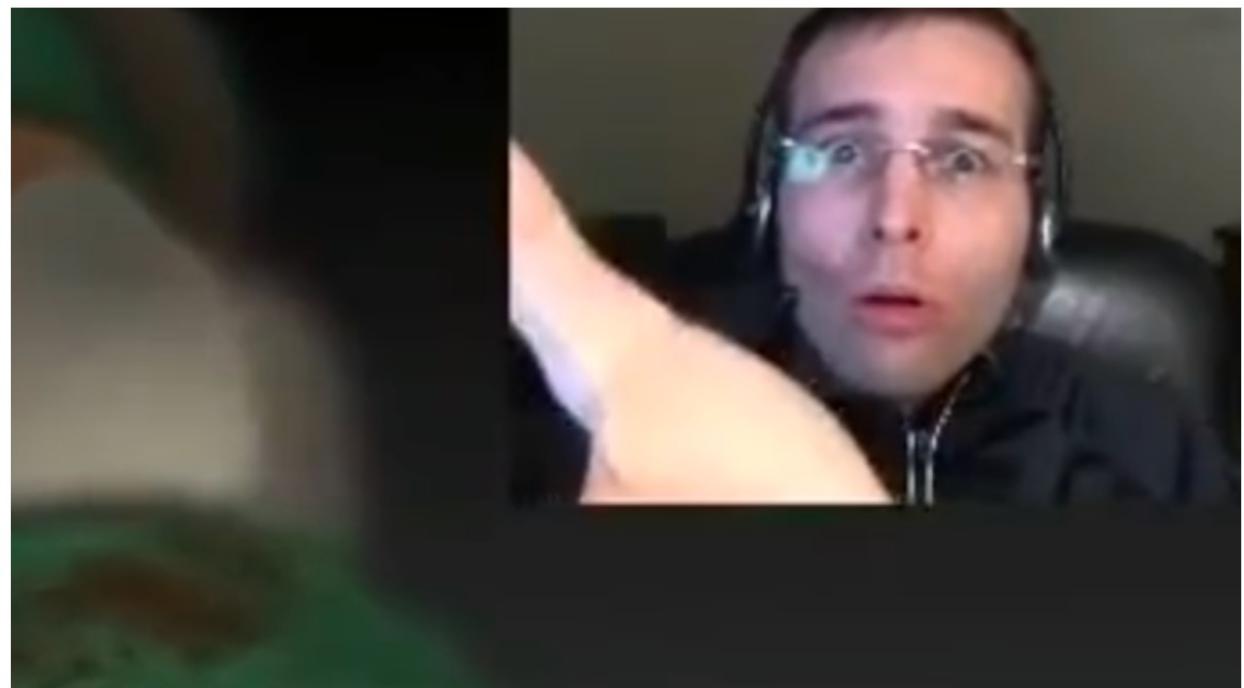


Figure 3. Twitch viewers expect streamers to use webcams, so they can share their emotional reactions.

Interaction and emotion

- IRC is where the community emerge and interact with streamers
- Viewers are expected to see streamers' emotions
- Streamers earn 2~5 USD per 1,000 impressions

Third Places

- “Public places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work” – Oldenburg
- Cafes, coffee shops, bars, etc.
- Conversation is the main activity



Discussion 4

Imagine you are a member of a streamer community. If you were given the chance to participate in events at “Third Places”, will you choose to participate? Why or why not?

Large streams and subdivision

- Streams can grow very large
- Larger streams are easier to draw more viewers
- Hypothesis: subdividing into smaller groups help maintain meaningful participation
- Breakout rooms on Zoom?





A Literature Review of Video-Sharing Platform Research in HCI

Authors: Ava Bartolome, Shuo Niu
Published at CHI 2023

Overview

- Reviewed 106 papers on video-sharing across HCI conferences and journals
- Identified 6 core research themes
- Concluded a framework with 5 components
- Used a variety of methods in literature review

Research questions

- 1. What are the common research themes in video-sharing HCI literature?
- 2. What methods are used to research video-sharing techniques and platforms?
- 3. What is the extent and nature of findings in video-sharing HCI literature?

6 core research themes

- (1) Online Communities and Internet Sub-cultures;
- (2) Social Participation and Relationships;
- (3) New Video Interaction Systems and Techniques;
- (4) Interaction with VSPs;
- (5) Videos as a Design Material;
- (6) Videos as a Machine Learning Dataset

Discussion 5

What are your thoughts on these 6 core research themes? If you have the opportunity, will you be interested in doing research any of these themes?

Methods

- Qualitative observation
- Interview
- Survey
- Big data analysis
- User study and evaluation

5 major components

- Creator
- Viewer
- Video
- Community
- Platform

TikTok

- Launched in Sep 2016
- Owned by ByteDance
- Fast-growing short-form video-sharing platform (VSP)
- 2nd most popular, only behind YouTube
- Algorithm is a recent focus in HCI



TikTok

Discussion 6

What makes TikTok so popular?

Corpus of papers

- Chosen words and phrases: “video sharing,” “video-sharing,” “online video,” “online-video.” “live streaming,” “live stream,” “livestream,” and “live-stream.”
- Papers were not chosen if: they were not focused on video-sharing, or were focused on non-VSP videos

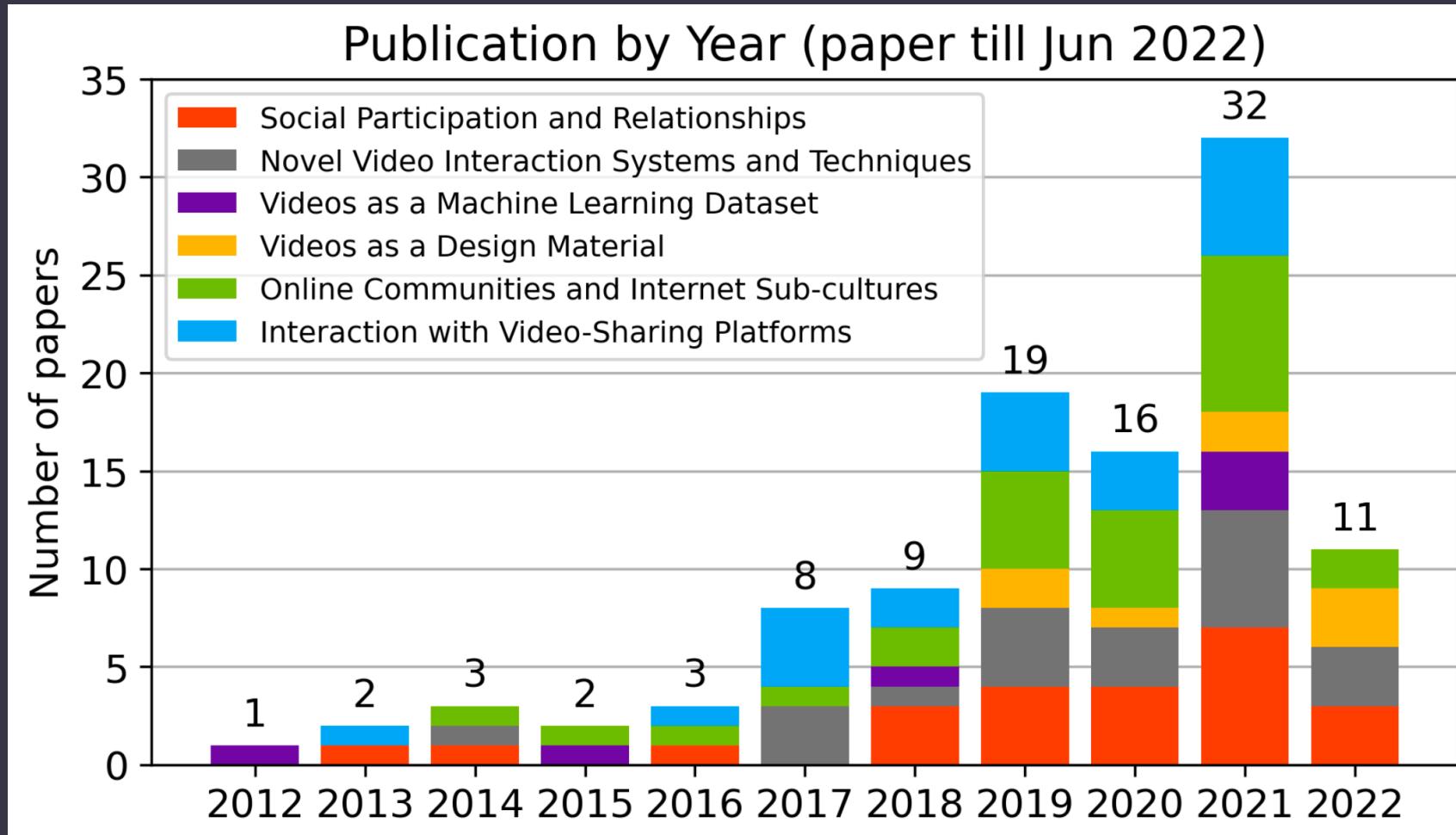
Conference	Acronym	Publisher
ACM CHI Conference on Human Factors in Computing Systems	CHI	ACM
ACM Conference on Computer-Supported Cooperative Work & Social Computing	CSCW	ACM
IEEE Transactions on Affective Computing	TAC	IEEE
ACM Conference on Pervasive and Ubiquitous Computing	UbiComp	ACM
International Journal of Human-Computer Studies	IJHCS	ELSEVIER
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies	IMWUT	ACM
Proceedings of the ACM on Human-Computer Interaction	PACMCHI	ACM
ACM Symposium on User Interface Software and Technology	UIST	ACM
Conference on Designing Interactive Systems	DIS	ACM
International Conference on Intelligent User Interfaces	IUI	ACM
Behaviour and Information Technology	BIT	Taylor&Francis
International Journal of Human-Computer Interaction	IJHCI	Taylor&Francis
ACM Transactions on Computer-Human Interaction	TOCHI	ACM
Universal Access in the Information Society	UAIS	Springer
International Conference on Multimodal Interfaces	ICMI	ACM
Virtual Reality	-	Springer
IEEE Virtual Reality Conference	IEEEVR	IEEE
HCI International	HCII	Springer

Table 1: The proceedings and journals for paper searching.
The list was retrieved from Google Scholar in Nov. 2021.

Research

- RQ1 (Themes): identified key sentences from the abstract that described the paper topic and pasted them into digital cards
- RQ2 (Method): conducted a multi-categorical encoding of the research methods based on Snelson's classification of data collection techniques
- RQ3 (Findings): analyzed the research findings following the three grounded theory steps

Publication by year



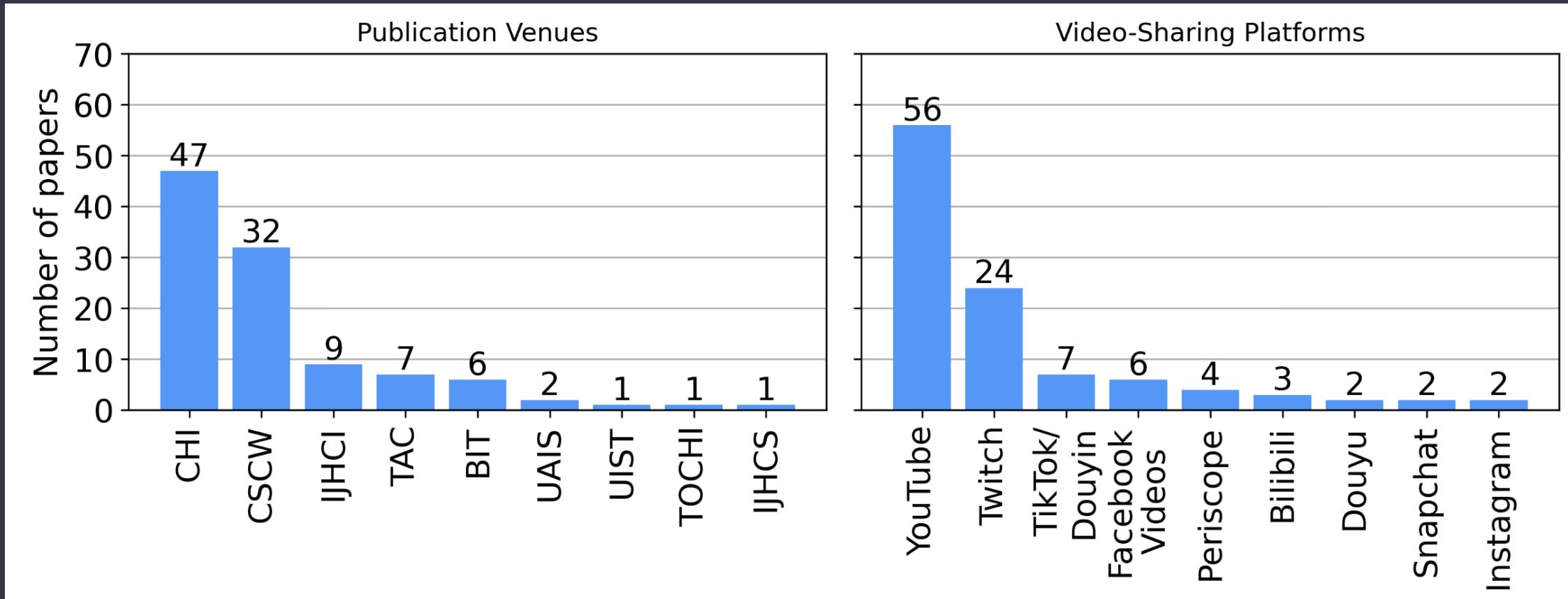
Discussion 7

Which category has the fastest growth? Why do you think that's the case?

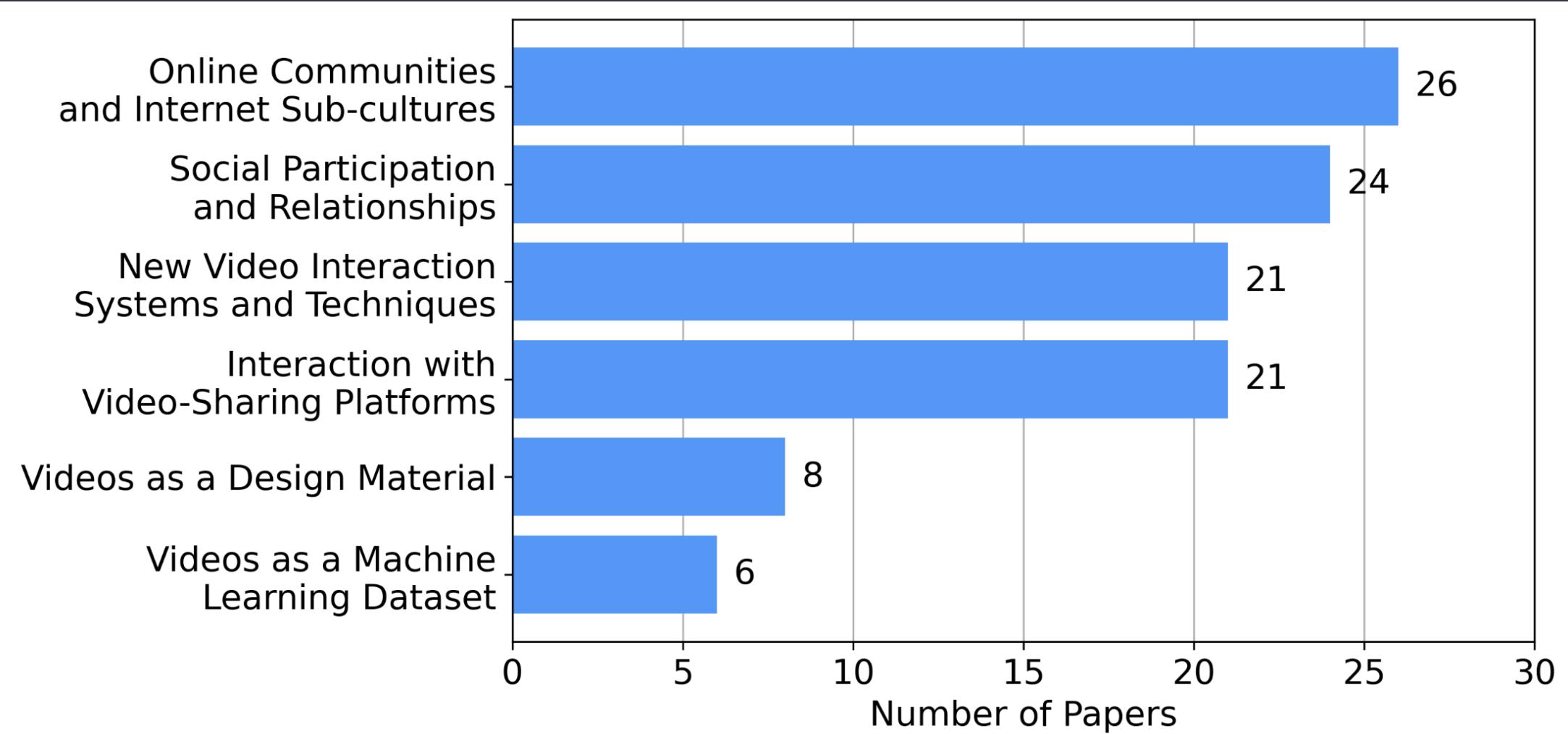
Word cloud

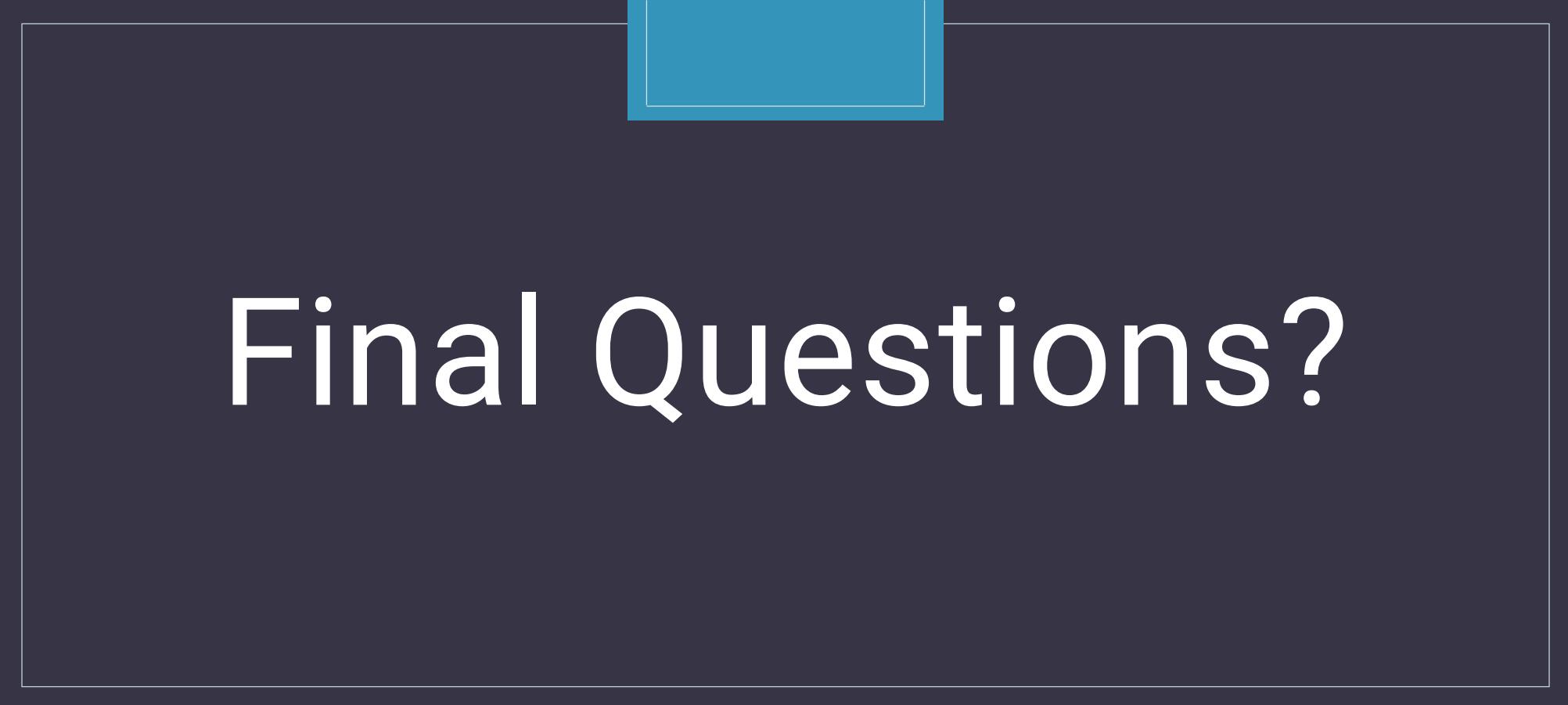


Conferences vs. VSPs (79 studies)



Distribution of 6 research themes

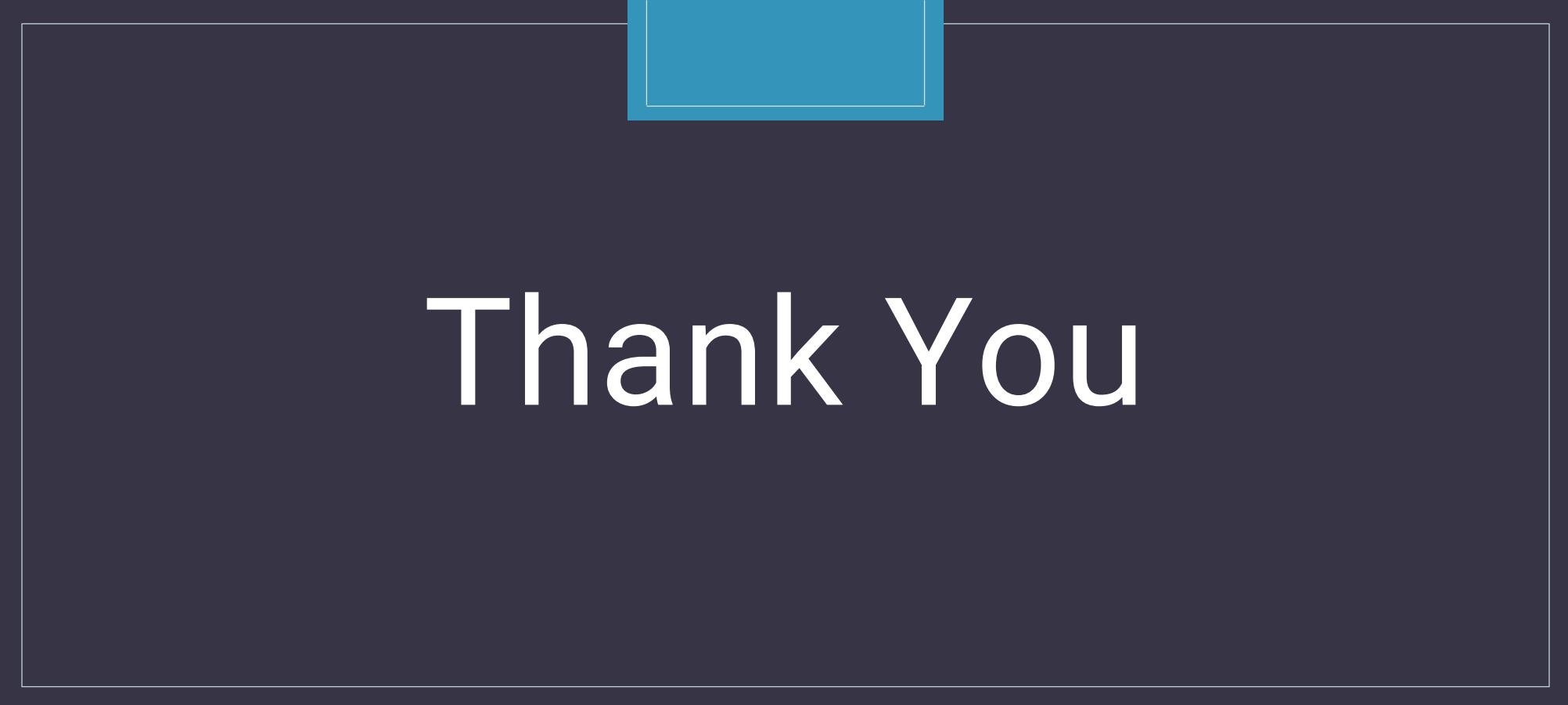




Final Questions?

Works Cited

- William A. Hamilton, Oliver Garretson, and Andruid Kerne. Streaming on Twitch: Fostering Participatory Communities of Play within Live Mixed Media. CHI (2014). <https://doi.org/10.1145/2556288.2557048>
- Ava Bartolome and Shuo Niu. A Literature Review of Video-Sharing Platform Research in HCI. CHI (2023).
<https://doi.org/10.1145/3544548.3581107>
- Software: Microsoft PowerPoint
- Theme: Savon
- Font: Roboto



Thank You