
All the World (Wide Web)’s A Stage: A Workshop on Live Streaming

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ABSTRACT

With the rise of live streaming and esports in recent years, it becomes increasingly important for the HCI community to understand this phenomenon. The organizers encourage people to submit papers with novel interfaces they wish to explore in a live streaming context. In this workshop, participants will discuss different facets of the live streaming experience and obtain a greater understanding of the culture that exists on streaming platforms like Twitch. They will then participate in a design exercise, forming groups and iterating on a design together. Discussion/design topics will include ideas encouraging audience participation, moderation of toxicity, and other such topics. Participants will leave the workshop with ideas about how they can better design games and other experiences taking the live streaming ecosystem into consideration.

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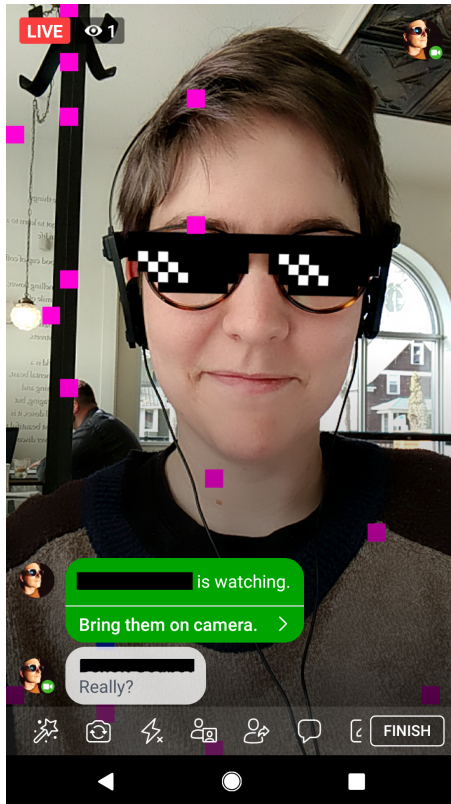


Figure 1: Organizer streaming on Facebook Live. Comments pop-up at the bottom of the video and customization options appear at the bottom of the screen.

CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**;

KEYWORDS

YouTube; Twitch; Live Streaming; Gameplay; eSports.

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INTRODUCTION

Since the advent of televised digital gaming in the 1990s, sharing gameplay video footage has been a fundamental part of gaming culture and activity. Additionally, esports (playing computer games in tournaments with spectators) has become an emerging phenomenon, driving interest in sharing both live and recorded gameplay (See Figure 2). In the last decade, video sharing services such as YouTube have become widespread. The intense popularity of the streaming phenomenon in recent years is largely due to the creation of Twitch. Twitch was founded in 2011 and since has become the leading service for gameplay streaming. The popularity of gameplay streaming continues to rise, with 100+ million unique viewers per month and 1.7+ million broadcasters per month [1]. The videogame live streaming market continues to grow with sites (such as YouTube) creating communities of their own.

While game streaming is extremely popular, streaming is hardly limited to games. Other commonly streamed activities include live coding, art, or other creative endeavors; talk shows and other conversational formats; and “IRL” activities, or streaming from daily life. Streaming activities are sometimes integrated into social media experiences, such as Facebook Live (See Figure 1) and Periscope, which are platforms that allow for immediate live-broadcasting from user’s mobile phones [13].

Streams face certain obstacles due to the nature of the platforms available such as the increased need for moderation of viewers toxic behavior, as well as the need for creating diverse and inclusive communities. Stakeholders must grapple with these problems using limited interfaces that may or may not be designed for the problem at hand. For example, the Twitch platform allows spectators to chat using both typed text and emotes, engaging in lively side conversation in real time. However, this interface does not allow spectators to reference visual or spatial game elements, and makes it difficult to share hidden information [11]. For audience members who hope to make their experiences more interactive, these limitations can be frustrating [12].

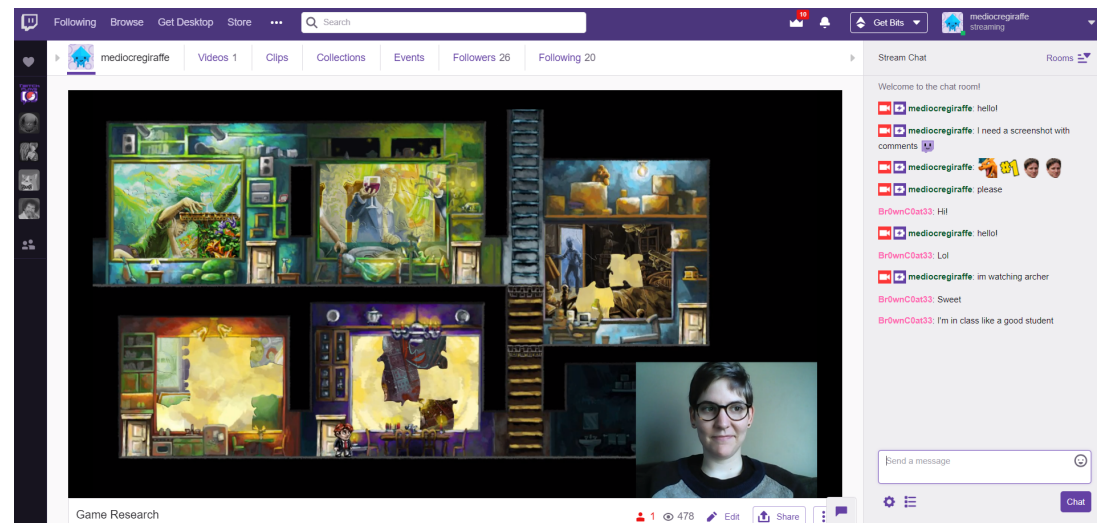


Figure 2: Organizer streaming a game on Twitch. Displayed in the lower right corner is the live-video feed, and to the right of the game/video feed is the live-chat.



Figure 3: *wgrates*' stream customization.

Both streamers and spectators regularly customize their experiences in order to interact more effectively, suggesting opportunities for interface design [2]. For example, Twitch streamer *wgrates* uses a green screen and face-capture technology and to turn himself into a dog avatar sitting behind a desk floating at the bottom left portion of his stream (see Figure 3).

While many tools are available for streamers, fewer opportunities are available for spectator customization. The workshop will explore new interfaces and experiences for live streaming (implemented in the specific context of Twitch) that can support a range of audience interactions and experiences.

BACKGROUND

The topic of live streaming and esports is of interest to the HCI community, as evidenced by papers and panels in the last few years [3, 5, 7, 8, 13]. For instance, Freeman and Wohn identify opportunities and challenges of studying eSports in the HCI community [3]. Examining the technical side of live streaming, numerous authors have created tools to augment the interactions between the streamer and the audience [7, 8]. Other authors focus on the sociological aspects of the phenomenon, considering the motivations and experiences of those who stream and spectate on live streaming platforms [5, 13].

ORGANIZERS

Raquel Robinson is a PhD student at the University of Saskatchewan studying Human-Computer Interaction. She received her Master's degree from the University of California, Santa Cruz where she developed the tool All the Feels to incorporate biometrics into online gameplay streams [9, 10]. She focuses on finding ways of enhancing connection and social and emotional engagement among people through visualizing biometric data in gameplay and gameplay streaming environments.

Jessica Hammer is the Thomas and Lydia Moran Assistant Professor of Learning Science with a joint appointment in the Human-Computer Interaction Institute and Entertainment Technology Center at Carnegie Mellon University. Her current research on Twitch involves creating games and tools that blur the lines between spectator, player, broadcaster, and designer [2, 4, 11]. She is also an award-winning game designer.

Katherine Isbister is Professor of Computational Media at the University of California, Santa Cruz, where she directs the Social and Emotional Technology Lab and supervises Robinson's work on streaming. Isbister has written several books, including "How Games Move Us", [6] about the emotional and social connections that games provide. Isbister's recent research focuses on augmenting social experience both in-person and across networks with strategic technological interventions.

Additionally, more specialized venues have addressed the phenomenon in recent years. A panel at CSCW in 2017 addressed the topic of live streaming from several industry and academic focused perspectives [14]. The University of Tampere held an academic seminar in 2017 on Spectating Play which focused specifically on watching game live streams and eSports. In response to this growing demand, we ran the "FDG Twitch workshop" on game live streaming at the Foundations of Digital Games Conference in 2018. Website: <https://bit.ly/2PJpbkw>. This workshop primarily focused on games, so in this follow-up workshop we extend beyond games to other kinds of live streamed experiences. This workshop is an opportunity to build on the growing interest that has been fostered at these other specialized venues. We aim to extend beyond the specifics of these specialized workshops to bring together the broader HCI community—at the largest venue for the community—CHI. Our goal is to bring together those who research live streaming from a variety of backgrounds including games, CSCW, social TV, and many others.

GOALS OF THE WORKSHOP

The goal of the workshop is to increase awareness within the HCI community about the live streaming phenomenon, open up a discussion about design opportunities and challenges when thinking about various platforms, and have participants collaborate on a research proposal, interface concept, or game design. We would like the participants to leave this workshop with new questions and ideas about opportunities for research relating to live streaming. We will recruit researchers who have either research questions that can be explored through streaming, or interfaces/interactions they would like to explore in a streaming context, or both. We expect 10-15 participants. This workshop will be streamed to Twitch, which will allow us to discuss topic in context. For this workshop, we are going beyond the walls of CHI to engage the larger community, while still giving the people in the room a chance to make focused progress.

WEBSITE

The website is available at this url:

<https://sites.google.com/view/chi-streaming-workshop/home>

The website consists of relevant dates, the call for participation (detailed in a section below), organizers, and accepted papers.

PRE-WORKSHOP PLANS

We will advertise the workshop by sending out emails to game researcher mailing lists (CHI, GAMES-NETWORK, SPECTATING PLAY among others). We will also reach out to attendees of the previous version of this workshop at FDG, along with those who submitted to the University of Tampere Spectating Play Academic Seminar in 2017.

WORKSHOP SCHEDULE

Introduction: First, there will be a few words from the organizers.

Presentations: Short presentations from each speaker (2-5 minutes each). These presentations will be streamed live to Twitch, bandwidth permitting.

Coffee Break (15 minutes).

Discussion: Discuss commonalities of our research. What are gaps or interesting directions that we would all like to see explored more? What do we wish was communicated better about this subject area?

Speed Dating: Pair up with another person and introduce yourself. Come up with a paper title and description of what it would be about with each person you are partnered with. During the speed dating session, each person works with every other person. Spectators watching this workshop on Twitch will vote on which topics to focus on after lunch. (10 minutes).

Lunch (1 hour).

Design Session: Form teams of two and begin design activity. In each team, one participant will provide a research question and the other will introduce an interface or interaction constraint, based on the proposal they submitted. Teams will sketch or describe a prototype that uses the proposed interface/interaction constraint and outline a study in which it could be used to explore the proposed research question. (90 minutes).

Design Session 2: Participants will be paired with a new partner. For those who submitted both a research question and an interface/interaction proposal, they will also switch roles. Teams will sketch prototypes and outline studies, as per Design Session 1. (90 minutes).

Coffee Break (15 minutes).

Share back: During the coffee break, sketches and outlines will be posted in the space. After the break, participants will leave feedback on one another's ideas using post-it notes (30 minutes). The organizers will select 3-5 proposals to seed a group discussion (60 minutes).

DISCUSSION TOPICS FOR WORKSHOP

The following questions are potential discussion topics for the *Discussion* section of the workshop or launching points for the design exercise. We will select among these and similar topics depending on the submissions we receive.

- What should designers keep in mind when designing interfaces and other experiences for live streaming?
- How much interactivity between the audience and a performer should there be in a digital environment?

- What does content customization mean on these platforms to both the spectators and the streamer? In what ways do streamers communicate with their audience?
- What can emote usage, extensions, and live chat in general add to the social experience?
- Communities on live streaming platforms like YouTube and Twitch vary by size - from one to 1-million viewers depending on the stream. How do these different sizes of communities affect the way the viewers and the streamers interact?
- How are game live streaming communities dealing with moderation of toxic behavior? How can companies like Twitch and YouTube encourage inclusion and diversity?
- E-Sports and live streaming is a large part of the mainstream culture in South Korea. Will it ever become as large of a phenomenon in the United States and what would this mean?

DESIGN EXERCISE

This design exercise aims to explore how our live streaming work might be enhanced by new kinds of data collection tools, i.e. what is the future of research on live streaming platforms like Twitch? Participants will imagine a new type of on-stream data collection, and a new type of off-stream data collection, that will help their research. Then they will be connecting the two to show how they would analyze and make meaning from them together (see Figure 4).

First, we will be thinking about new tools for stream data (top left), and then for off-stream data (bottom left). Finally, we will be doing an exercise for integrating the two data sources. This will then be followed by a short break— before any exercises start—for participants to silently reflect on the questions they think are important and wish they could answer in a fantasy world.

Stream Data Exercise

With markers, participants will draw on a screenshot of a live stream to show a new collection tool they would like to see. They will be allowed 5-8 minutes to draw, and afterwards will share back.

Off-stream Data Exercise

With play-doh, participants will be creating a piece of hardware that collects off-stream data; which they will sculpt. They will be allowed 5-8 minutes to sculpt. After, participants will share back, and we will photograph their sculptures.

Meaning-making Exercise

Participants will write down the research question at the top of the sheet. They will write what data is coming from the stream (top left) and what data is coming from off-stream (bottom left). Then,

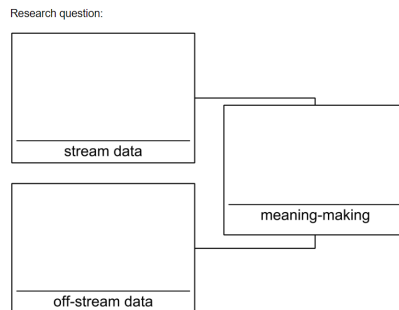


Figure 4: Design exercise worksheet.

they will write down how they inform each other (right box). Share back. Organizers will collect worksheets, screenshot drawings, and photograph the sculptures.

POST-WORKSHOP PLANS

After running this workshop at FDG 2018 (Foundations of Digital Games Conference), we identified lessons that will inform the direction and outcomes for this follow-up workshop at CHI. First, there was a consensus that researchers in this domain would like more cross disciplinary conversations. We expect that simply hosting this workshop at CHI will address this issue. Additionally, connecting this community of researchers is important because this is a developing research topic within HCI. We will poll attendees about their preferred communication solution and create either a mailing list, website, Facebook group for Twitch focused research, to help people work together and accelerate progress within the field. After the workshop, we will collaborate on a special issue of a journal. TOCHI: Human-Computer Interaction, Interaction Studies, International Journal of Human-Computer Studies are all publication options which will be considered. Further, we will discuss the idea of starting a collective live streaming channel amongst all participants that attend the workshop. Topics for what the stream should focus on will be discussed during the session.

CALL FOR PARTICIPATION

We are looking for researchers and designers who want to work on live streaming to join our workshop at the Computer-Human Interaction (CHI) conference in Glasgow, Scotland this May. Our goals are to increase awareness of live streaming within the HCI community, to start a discussion about research and design opportunities in the streaming context, and to generate new questions about research relating to this topic. During the workshop, we will be doing collaborative exercises to help you to connect your existing research interests and expertise to live streaming, and to generate new game and/or interface design proposals around live streaming experiences. You do not need to be a streaming expert to join this workshop. We are looking for people with a range of backgrounds and experiences. If your research questions might be of interest in a streaming environment, or you would like to design new experiences for live streaming, this workshop is for you.

For further information, write to rbreejon@gmail.com or see the workshop website, <https://bit.ly/2QRqum6>.

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