
Visual Dashboard Design for eSports Spectatorship: Opportunities and Challenges

Qiyu Zhi

University of Notre Dame
Notre Dame, IN, USA
qzhi@nd.edu

Ronald Metoyer

University of Notre Dame
Notre Dame, IN, USA
rmetoyer@nd.edu

Abstract

Spectatorship is an integral part of the massively popular eSports due to its spectator-friendly nature. Previous research has examined eSports fans' spectator motivation and the role of technology in supporting and enriching fans' spectator experience for eSports and traditional sports as well. Inspired by this work, we discuss the opportunities and challenges of three future directions on designing a visual dashboard for eSports spectatorship.

Author Keywords

eSports; eSports spectator; visualization dashboard; visual interface;

CCS Concepts

•**Human-centered computing** → **HCI design and evaluation methods; Visualization systems and tools; Collaborative and social computing systems and tools;**

Background

eSports and eSports Spectatorship

As defined by Hamari and Sjöblom [6], eSports is “a form of sports where the primary aspects of the sport are facilitated by electronic systems; the input of players and teams, as well as the output of the eSports system, are mediated by human-computer interfaces.” The increasingly growing internet access and mobile devices have massively boosted

the eSports industry as its content mainly conveyed through internet broadcasting (e.g, live streaming) [11]. Besides attracting millions of online spectators, eSports events have also sold out major sports arenas such as Madison Square Garden in New York and Bird's Nest in Beijing [8].

Here we focus on the online spectator experience, which differs from the more passive traditional sports spectator experience on television. Most eSports teams and organizations rely on live-streaming platforms including Twitch, YouTube, and Facebook to broadcast live events to a massive audience [3]. These platforms fulfill spectators' social needs by enabling game viewing, commenting, and chatting with other fans.

Spectator Motives

To understand why people watch eSports, Cheung and Huang analyzed 127 spectators' stories and characterized them into nine personas: The Bystander, The Curious, The Inspired, The Pupil, The Unsatisfied, The Entertained, The Assistant, The Commentator, and The Crowd [5]. Hamari and Sjöblom also examined the motivations of eSports consumers by surveying 888 people online [6]. They found escapism, acquiring knowledge about the games being played, novelty and eSports athlete aggressiveness are the main motivations.

More recently, Pizzo et. al. compared the motives between eSports and traditional sports spectators [10]. They concluded traditional sport and eSports are similarly consumed and suggested marketing strategies for traditional sports are also applicable in eSports. Qian et. al. identified several dimensions of esports online spectator demand based on interviews and online open-ended surveys, in which "chat room", "streamer traits", "stream quality", and "virtual rewards" are unique factors in eSports [11].

Dashboards for Sports Spectator

Sports events, including eSports, generate a large amount of data that can potentially provide valuable and potentially novel insight for spectators [1]. Previous research has explored how to design a visual dashboard for sports event spectatorship. For traditional sports, Perin et. al. presented SoccerStories to support analysts in exploring soccer games in a visualization dashboard [9]. Zhi et. al. designed a prototype, GameViews-Fans, to support basketball fans in spectating game data and chatting with others while watching the game [14]. In eSports, Charleer et. al. designed two dashboards to improve spectator experience for League of Legends and CS:GO [4]. They found spectators thought highly of the dashboards as they helped gameplay interpretation.

Opportunities and challenges

We propose a real-time visual dashboard can potentially transform the spectator experience from passive to engaging and active. Inspired by the aforementioned research endeavors, we discuss the opportunities and challenges of three future directions on designing a visual dashboard for eSports spectatorship.

Supporting at-a-glance Experience

Besides the streaming video, spectators may also want to understand other information such as real-time gameplay metrics and players' match history. Visual representation of game information in the dashboard can reduce the spectator's cognitive load, provide additional information, and direct spectator to the relevant in-game events [4, 14].

However, challenges exist as visualizations are often underestimated by spectators when it's too complicated to understand [14]. Visualizations can also be distracting and have a negative impact on spectator experience [4]. Thus,

further research is needed to design a visual dashboard that provides the “at-a-glance” information in an accurate and direct way.

Integrating Social Functions into Dashboard

Social opportunity is an integral part of eSports spectator motives [10]. Major game streaming platforms provide comment functions and chat service where spectators can communicate with each other. Chat service has also been integrated into the sports spectator dashboard and the study showed spectators felt engaged with the chat service [14].

Further research needs to go beyond the basic chat function and explore new interaction paradigms to enrich the spectator experience. For example, visualizations that represent gameplay information could be coupled with text messages in the chat service [16, 7]. Spectators love watching interesting and creative plays [11]. Thus these highlight videos could be explicitly coupled to comments and data to further engage the fan beyond the video.

Conversational agents (chatbots) as an innovative outlet are also increasingly being used to deliver game information and engage fans. We developed GameBot, an interactive chatbot for sports fans to explore game statistical data [15]. Bieliauskas and Schreiber proposed a chatbot to customize real-time visualizations by “observing” users’ chat [2]. These ideas could be worth pursuing for enriching spectator experience.

Designing Personalized Spectator Experience

It is difficult to fit the streaming video, real-time game information visualizations and chat service in one dashboard. Through investigations of World of Warcraft UI designers, Targett et al. suggested the interface of a videogame should be customized to meet different players’

needs [12]. For spectator dashboard design, a study showed the needs of flexible solutions such as allowing users to resize dashboard sections [4]. Thus, we could customize the dashboard or provide customizability functions for individual spectators to meet different needs. Inspired by previous work on adaptive information visualization [13], designing personalized spectator dashboard would benefit from investigating the effect of personal characteristics and context of each individual spectator.

Conclusion

In this paper, we briefly went through related papers on eSports spectatorship, spectator motives, and dashboard design for sports spectator. Based on these prior work, we discussed three research directions on visual dashboard design for eSports spectatorship. We would like to increase the awareness of eSports research in the HCI community and discuss these topics in detail in the workshop.

REFERENCES

- [1] Rahul C Basole and Dietmar Saupe. 2016. Sports data visualization [guest editors’ introduction]. *IEEE Computer Graphics and Applications* 36, 5 (2016), 24–26.
- [2] Stefan Bieliauskas and Andreas Schreiber. 2017. A conversational user interface for software visualization. In *2017 IEEE working conference on software visualization (vissoft)*. IEEE, 139–143.
- [3] Brandon Brathwaite. 2018. Breaking Down the Major Streaming Platforms in Esports. (2018). Retrieved Feb.8th, 2020 from <https://esportsobserver.com/breakdown-streaming-platforms/>.
- [4] Sven Charleer, Kathrin Gerling, Francisco Gutiérrez, Hans Cauwenbergh, Bram Luycx, and Katrien Verbert.

2018. Real-time dashboards to support esports spectating. In *Proceedings of the 2018 Annual Symposium on Computer-Human Interaction in Play*. 59–71.
- [5] Gifford Cheung and Jeff Huang. 2011. Starcraft from the stands: understanding the game spectator. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 763–772.
- [6] Juho Hamari and Max Sjöblom. 2017. What is eSports and why do people watch it? *Internet research* (2017).
- [7] Ronald Metoyer, Qiyu Zhi, Bart Janczuk, and Walter Scheirer. 2018. Coupling story to visualization: Using textual analysis as a bridge between data and interpretation. In *23rd International Conference on Intelligent User Interfaces*. 503–507.
- [8] Sarah E. Needleman. 2015. Inside the ‘League of Legends’ Championship at Madison Square Garden. (2015). Retrieved Feb.8th, 2020 from <https://blogs.wsj.com/digits/2015/08/23/e-sports-event-scores-at-madison-square-garden/>.
- [9] Charles Perin, Romain Vuillemot, and Jean-Daniel Fekete. 2013. SoccerStories: A kick-off for visual soccer analysis. *IEEE transactions on visualization and computer graphics* 19, 12 (2013), 2506–2515.
- [10] Anthony D Pizzo, Sangwon Na, Bradley J Baker, Mi Ae Lee, Doohan Kim, and Daniel C Funk. 2018. eSport vs. Sport: A Comparison of Spectator Motives. *Sport Marketing Quarterly* 27, 2 (2018).
- [11] Tyreal Yizhou Qian, James Jianhui Zhang, Jerred Junqi Wang, and John Hulland. 2019. Beyond the game: Dimensions of esports online spectator demand. *Communication & Sport* (2019), 2167479519839436.
- [12] Sean Targett, Victoria Verlysdonk, Howard J Hamilton, and Daryl Hepting. 2012. A study of user interface modifications in World of Warcraft. *Game Studies* 12, 2 (2012).
- [13] Dereck Toker, Cristina Conati, Giuseppe Garenini, and Mona Haraty. 2012. Towards adaptive information visualization: on the influence of user characteristics. In *International conference on user modeling, adaptation, and personalization*. Springer, 274–285.
- [14] Qiyu Zhi, Suwen Lin, Poorna Talkad Sukumar, and Ronald Metoyer. 2019a. GameViews: Understanding and Supporting Data-driven Sports Storytelling. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. ACM, 269.
- [15] Qiyu Zhi and Ronald Metoyer. 2020. GameBot: A Visualization-augmented Chatbot for Sports Game. In *CHI Extended Abstracts*.
- [16] Qiyu Zhi, Alvitta Ottley, and Ronald Metoyer. 2019b. Linking and Layout: Exploring the Integration of Text and Visualization in Storytelling. In *Computer Graphics Forum*, Vol. 38. Wiley Online Library, 675–685.