



Research article

Audience participation fighting game: Exploring social facilitation for an enhanced APG experience

Pujana Paliyawan^a, Ruck Thawonmas^{b,*}, Kingkarn Sookhanaphibarn^c,
Worawat Choensawat^c^a Ritsumeikan Center for Game Studies, Ritsumeikan University, Kyoto, Japan^b College of Information Science and Engineering, Ritsumeikan University, Japan^c Multimedia Intelligent Technology Lab, Bangkok University, Thailand

ARTICLE INFO

Dataset link: <https://osf.io/vefrd/>

Keywords:

Audience participation games

Game live streaming

Game AI

HCI

ABSTRACT

This paper discusses the popularity of live streaming video games and its potential to address psychological challenges, especially during the COVID-19 pandemic. An audience participation game (APG) that involve massive audiences in gameplay, blurring the lines between viewers and players, is introduced. The game highlights the dynamic adjustment of AI character strengths based on audience inputs, specifically cheering and jeering. The study examines factors that influence user experience (UX) and activeness in APG. System evaluation includes comprehensive AI testing, consisting of 500,000 one-minute game rounds, and a user experiment involving 82 participants. UX assessment is conducted using a pairwise preference, four-alternative forced choice (4-AFC), version of the Game User Experience Satisfaction Scale (GUESS). Finally, the paper concludes by offering guidelines and hypotheses for future research in the field of APGs.

1. Introduction

Live streaming video games, particularly on platforms like Twitch, have gained immense popularity [12]. Twitch has cultivated a global community through user-generated live streaming, offering live social interaction unlike other platforms [5]. The number of Twitch broadcasters and users has significantly increased, especially during the COVID-19 pandemic when social distancing became prevalent: the number of Twitch broadcasters and users has increased rapidly to 9 and 2.84 millions—about 4 times from 2017 to 2021.¹

The World Health Organization (WHO) has highlighted the mental health crisis caused by COVID-19, emphasizing the importance of social contact through online channels, games, and social media.² Therefore, in this era, live streaming games on platforms like Twitch have evolved beyond entertainment to become a potential solution for helping individuals cope with psychological problems. Twitch facilitates community building by providing social connectivity, interactivity, and opportunities for content discovery [23]. Live-streams serve as virtual places that foster multidimensional relationships between streamers and audiences, establishing com-

* Corresponding author.

E-mail address: ruck@is.ritsumei.ac.jp (R. Thawonmas).¹ <https://www.businessofapps.com/data/twitch-statistics/>.² www.who.int/campaigns/connecting-the-world-to-combat-coronavirus/healthyathome/healthyathome--mental-health.<https://doi.org/10.1016/j.heliyon.2023.e23967>

Received 22 July 2023; Received in revised form 12 December 2023; Accepted 23 December 2023

Available online 2 January 2024

2405-8440/© 2023 The Author(s).

Published by Elsevier Ltd.

This is an open access article under the CC BY license

<http://creativecommons.org/licenses/by/4.0/>.