



HAL
open science

Web3D Distance live workshop for children in Mozilla Hubs

Liudmila Bredikhina, Toya Sakaguchi, Akihiko Shirai

► **To cite this version:**

Liudmila Bredikhina, Toya Sakaguchi, Akihiko Shirai. Web3D Distance live workshop for children in Mozilla Hubs. 25th International Conference on 3D Web Technology, Nov 2020, Virtual event, South Korea. 10.1145/3424616.3424724 . halshs-03781969

HAL Id: halshs-03781969

<https://shs.hal.science/halshs-03781969v1>

Submitted on 20 Sep 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Web3D Distance live workshop for children in Mozilla Hubs

Liudmila Bredikhina
Geneva University
liudmila.bredikhina@gmail.com

Toya Sakaguchi
Shizuoka University
sakaguchi.toya.17@shizuoka.ac.jp

Akihiko Shirai
GREE VR Studio Laboratory
akihiko.shirai@gree.net



Figure 1: Hubs environment of the workshop and snapshot.

ABSTRACT

This paper proposes the design and procedures of a live workshop for children in Mozilla Hubs. We developed a step-by-step method called “Sugoroku,” spatial design, and audio effective calculations. The method proved to be efficient during the kids’ workshop. The “Sugoroku” method can be implemented in other systems.

CCS CONCEPTS

• **Applied computing** → *Arts and humanities*; • **Social and professional topics** → *Computing education*.

KEYWORDS

Web3D, Web/mobile 3D content creation, collaborative education

ACM Reference Format:

Liudmila Bredikhina, Toya Sakaguchi, and Akihiko Shirai. 2020. Web3D Distance live workshop for children in Mozilla Hubs. In *The 25th International Conference on 3D Web Technology (Web3D '20)*, November 9–13, 2020, Virtual Event, Republic of Korea. ACM, New York, NY, USA, 2 pages. <https://doi.org/10.1145/3424616.3424724>

1 INTRODUCTION

This century has been seeing an array of digital practices for teaching [Greenhow et al. 2009]: online conferences, webinars [Peuler and McCallister 2018], and virtual worlds as learning experiences [Lu 2013; Serafin et al. 2019]. The pandemic forced education to go digital and adopt software such as ZOOM¹ [Romero-Ivanova et al.

¹<https://zoom.us/>

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

Web3D '20, November 9–13, 2020, Virtual Event, Republic of Korea

© 2020 Copyright held by the owner/author(s).

ACM ISBN 978-1-4503-8169-7/20/11.

<https://doi.org/10.1145/3424616.3424724>

2020; Stefanile 2020]. However, ZOOM also came with disadvantages such as lack of human affect and security issues [Murillo Dias et al. 2020; Ramsook and Thomas 2019].

Mozilla Hubs² (Social Virtual Environment (SVE) platform accessible in any 2D web browser) has been implemented as a solution for attending conferences and education [Le et al. 2020]. Virtual worlds have educational benefits [Gerstein 2009; Shirai et al. 2002], such as an increase in social competence [Laal and Ghodsi 2012]. Drawing back on the advantages of Hubs [Le et al. 2020], a Web3D distance live workshop for children in Hubs took place on August, 12th, 2020. The goal of the workshop was to teach kids about live-entertainment production in Web 3D. Kids could choose their avatars (thus masquerading their identity), and create short videos for their family or friends.

2 METHOD

2.1 Hardware and Software

PC or Mac with an Internet connection and a browser (Chrome or Firefox) were required for this workshop. The online workshop used Mozilla Hubs: a web-based application that features 3D virtual rooms accessible through the link that is generated by the room creator. ZOOM was used as a technical support channel at the entry of the workshop and for observing participants’ faces.

2.2 Workshop Procedure

The event organizer selected 15 participants per session, aged between 9year-old to 15years-old. Participants were selected from the public³. The ration between male and female participants was 1:1.

To begin the workshop, participants had to log into Zoom. They were then guided by a workshop staff member to Hubs. In Hubs, the participants were greeted by the workshop staff. The kids then followed the staff to each zone. The workshop lasted 1.5h. Staff members filmed the workshop and streamed it on YouTube Live using OBS (Fig2).

²<https://hubs.mozilla.com/>

³<https://eventregist.com/e/FjI7sx9e98U6>

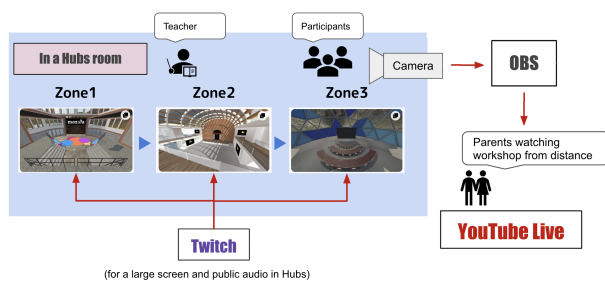


Figure 2: Broadcasting system using Hubs.

2.3 “Sugoroku” method

The virtual environment was designed to adapt to kids’ different participation speeds and needs. The Hubs virtual environment was as shown in Fig1. In order to do so, we designed a spatial design step-by-step method called “Sugoroku.”

“Sugoroku” is a traditional Japanese board game. There’re two forms of “Sugoroku,” one similar to the Western backgammon, and the other similar to the Western snakes and ladders[Culin 1920]. In both cases, what was of great interest for us was the “step-by-step” network organization of the game. The players had to follow the path in order to achieve their goal.

We adapted the “step-by-step” network play system of “Sugoroku” to the Web3D conference spatial design. Kids played in their own zone (line), before moving to the next stage. We separated the virtual environment into three zones: zone(1) overview and character design, zone(2) scenario and message design, zone(3) recording area (Fig1). Once each step was completed, kids moved to the next zone.

2.4 Spatial audio system

Cross-talk issue exists in Hubs (Fig3). Usually there is an unspecified number of dynamic moving speakers at the same time. Dynamic moving users in one part of the room can hear dynamic moving users from the opposite side of the room. In real-time processing environmental effects were not possible to implement. To resolve this cross-talk issue, we used panner node [Mozilla 2020]. The audio volume was adjusted based on the distance between dynamic moving users. The speed of volume reduction was also controlled.

For kids’ workshop, the venue was divided into three zones. The basic conversational voice was set to the “linear” model instead of the “inverse” (default in Hubs). The endpoint of the attenuation was set to 15 m, which was based on the radius of the zones. Kids could speak freely, and cross-talk issue was resolved.

3 CONTRIBUTION

During the kids’ workshop, we developed a new method called “Sugoroku” for step-by-step workshops. The method proved to be useful in guiding children during the workshop. The spatial audio design with the panner node’s linear model made it possible to be in different parts of the Hubs environment and not disturbed by



Figure 3: Cross-talk between different speakers.

other participants. The venue is accessible on Mozilla Hubs⁴. Our “Sugoroku” method makes it easier for participants with different participation speed to advance through workshops. The “Sugoroku” step-by-step method can be implemented in other workshops.

REFERENCES

- Stewart Culin. 1920. THE JAPANESE GAME OF SUGOROKU. *The Brooklyn Museum Quarterly* 7, 4 (1920), 213–233. <http://www.jstor.org/stable/26459343>
- Jackie Gerstein. 2009. Beyond the Game: Quest Atlantis as an Online Learning Experience for Gifted Elementary Students. *Journal of Virtual Worlds Research: Pedagogy, Education and Innovation in Virtual Worlds* 2 (03 2009). <https://doi.org/10.4101/jvwr.v2i1.403>
- Christine Greenhow, Beth Robelia, and Joan E. Hughes. 2009. Learning, Teaching, and Scholarship in a Digital Age. *Educational Researcher* 38 (2009), 246 – 259.
- Marjan Laal and Seyed Ghodsi. 2012. Benefits of collaborative learning. *Procedia - Social and Behavioral Sciences* 31, 1 (12 2012), 486–490. <https://doi.org/10.1016/j.sbspro.2011.12.091>
- Duc Le, Blair MacIntyre, and Jessica Outlaw. 2020. Enhancing the Experience of Virtual Conferences in Social Virtual Environments. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*. IEEE, Atlanta, USA, 485–494. <https://doi.org/10.1109/VRW50115.2020.00101>
- Lilly Kelan Lu. 2013. 3D Virtual Worlds as Art Media and Exhibition Arenas: Students’ Responses and Challenges in Contemporary Art Education. *Studies in Art Education* 54 (2013), 232 – 245.
- MDN contributors Mozilla. 2020 (accessed September 16 2020). *Web technology for developers - Web APIs - PannerNode*. Mozilla. <https://developer.mozilla.org/en-US/docs/Web/API/PannerNode>
- Murillo Dias, Raphael De Oliveira Albergarias Lopes, and André Teles. 2020. Will Virtual Replace Classroom Teaching? Lessons from Virtual Classes via Zoom in the Times of COVID-19. *Journal of Advances in Education and Philosophy* 4, 5 (2020), 171–176. <https://doi.org/10.13140/RG.2.2.34995.45601>
- Mollie Peuler and Kelly McCallister. 2018. Virtual and Valued: A Review of the Successes (and a Few Failures) of the Creation, Implementation, and Evaluation of an Inaugural Virtual Conference and Monthly Webinars. *Journal of Library & Information Services in Distance Learning* 13 (09 2018), 1–11. <https://doi.org/10.1080/1533290X.2018.1499240>
- Leela Ramsook and Ms Thomas. 2019. Perspectives of Prospective teachers on Zoom as a transformative teaching methodology. *International Journal for Innovation Education and Research* 7, 11 (12 2019), 946–957. <https://doi.org/10.31686/ijer.Vol7.Iss11.1955>
- Christina Romero-Ivanova, Michael Shaughnessy, Laura Otto, Emily Taylor, and Emma Watson. 2020. Digital Practices & Applications in a Covid-19 Culture. *Higher Education Studies* 10 (07 2020), 80. <https://doi.org/10.5539/hes.v10n3p80>
- Stefania Serafin, Federico Avanzini, Amalia Götzen, Cumhur Erkut, Michele Geronazzo, Francesco Grani, Niels Nilsson, and Rolf Nordahl. 2019. Reflections from five years of Sonic Interactions in Virtual Environments (SIVE) workshops. *Journal of New Music Research* 49, 1 (12 2019), 24–34. <https://doi.org/10.1080/09298215.2019.1708413>
- Akihiko Shirai, Shoichi Hasegawa, Yasuharu Koike, and Makoto Sato. 2002. Penguin hockey: a virtual reality game system for children. In *IFIP First International Workshop on Entertainment Computing (IWEC 2002)*. Entertainment Computing: Technologies and Applications, Makuhari, Japan, 447–454.
- Adam Stefanile. 2020. The Transition From Classroom to Zoom and How it Has Changed Education. *JOURNAL OF SOCIAL SCIENCE RESEARCH* 16 (07 2020), 33–40. <https://doi.org/10.24297/jssr.v16i.8789>

⁴<https://hubs.mozilla.com/vyKcJkk/>