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# Web3D Distance live workshop for children in Mozilla Hubs

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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:

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## 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 ZOOM<sup>1</sup> [Romero-Ivanova et al.

<sup>1</sup><https://zoom.us/>

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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 Hubs<sup>2</sup> (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 public<sup>3</sup>. 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).

<sup>2</sup><https://hubs.mozilla.com/>

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

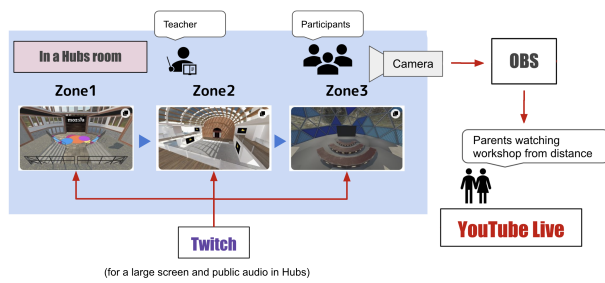


Figure 2: Broadcasting system using Hubs.

### 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 Hubs<sup>4</sup>. 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.

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<sup>4</sup><https://hubs.mozilla.com/vyKcJkk/>