

---

# **Open, Accessible & Delightful**

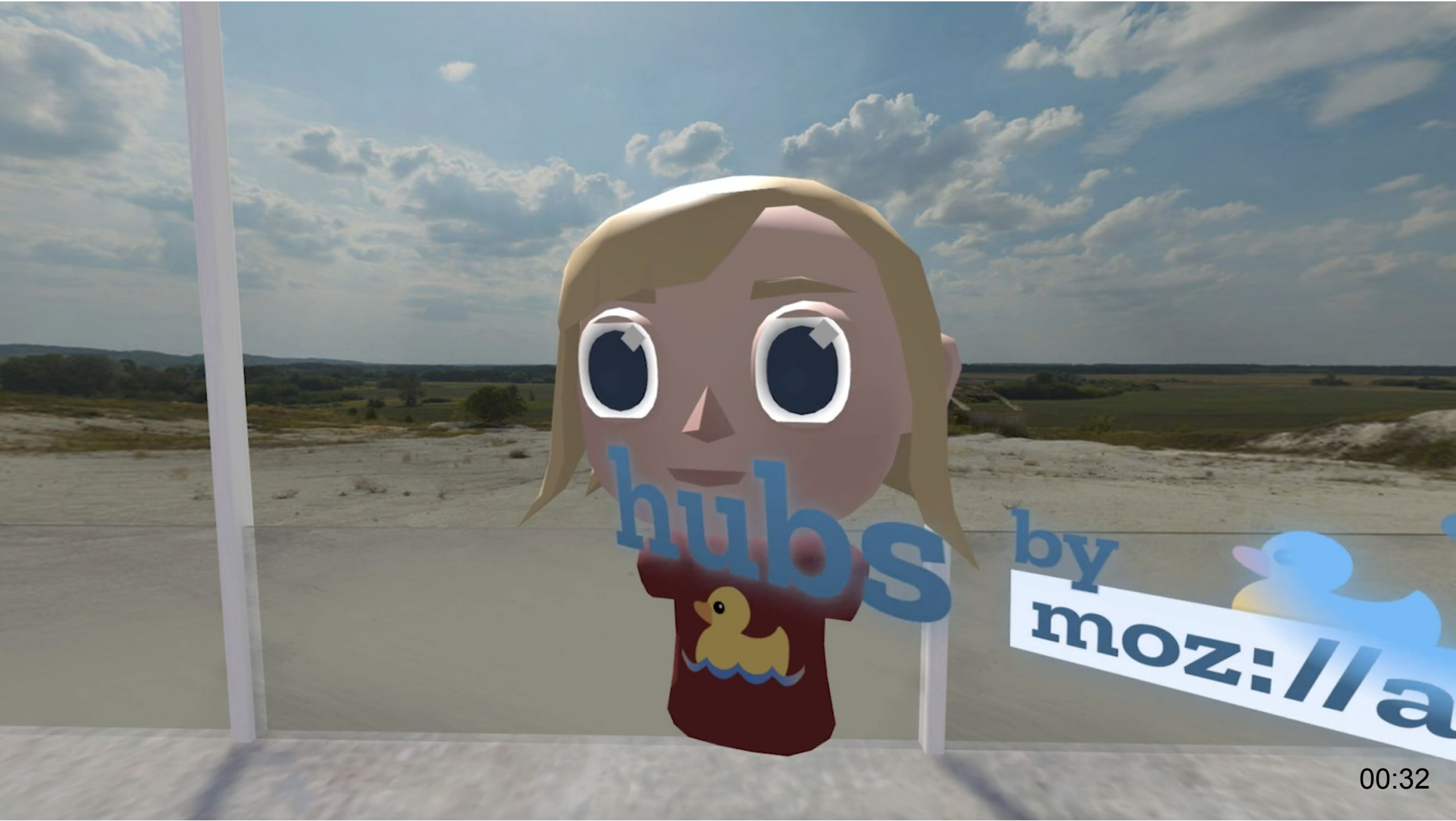
**Building the Mozilla Hubs community during COVID-19**

**Hi, I'm Elgin**

00:10



00:24



00:32



Open  
Accessible  
Delightful



# Try Hubs

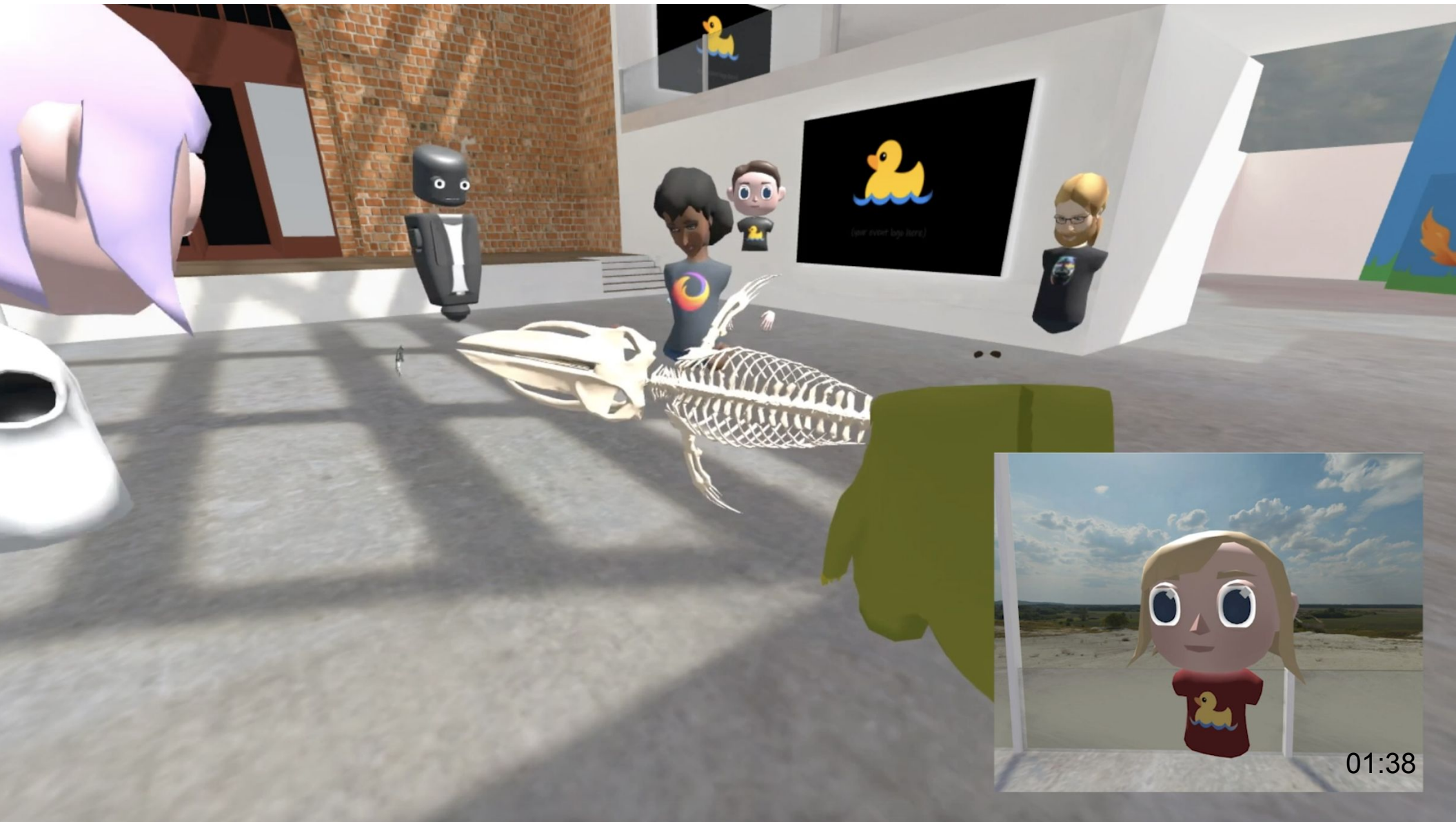
# Strategies



---

**What is Hubs?**





Share a virtual room with friends.  
Watch videos, play with 3D objects, or  
just hang out.

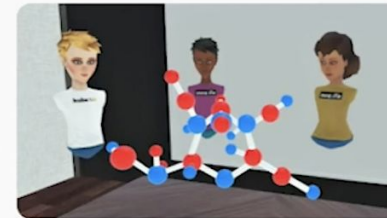


**Instantly create rooms**



**Communicate naturally**

Choose an avatar to represent you, put on your headphones, and jump right in. Hubs makes it easy to stay connected with voice and text chat to other people in your private room.



**An easier way to share media**

Share content with others in your room by dragging and dropping photos, videos, PDF files, links, and 3D models into your space.

**hubs.mozilla.com**

# hubs by mozilla

Room Name

## Stupendous Flashy Meetup

Join Room

Enter On Device

Spectate

Options



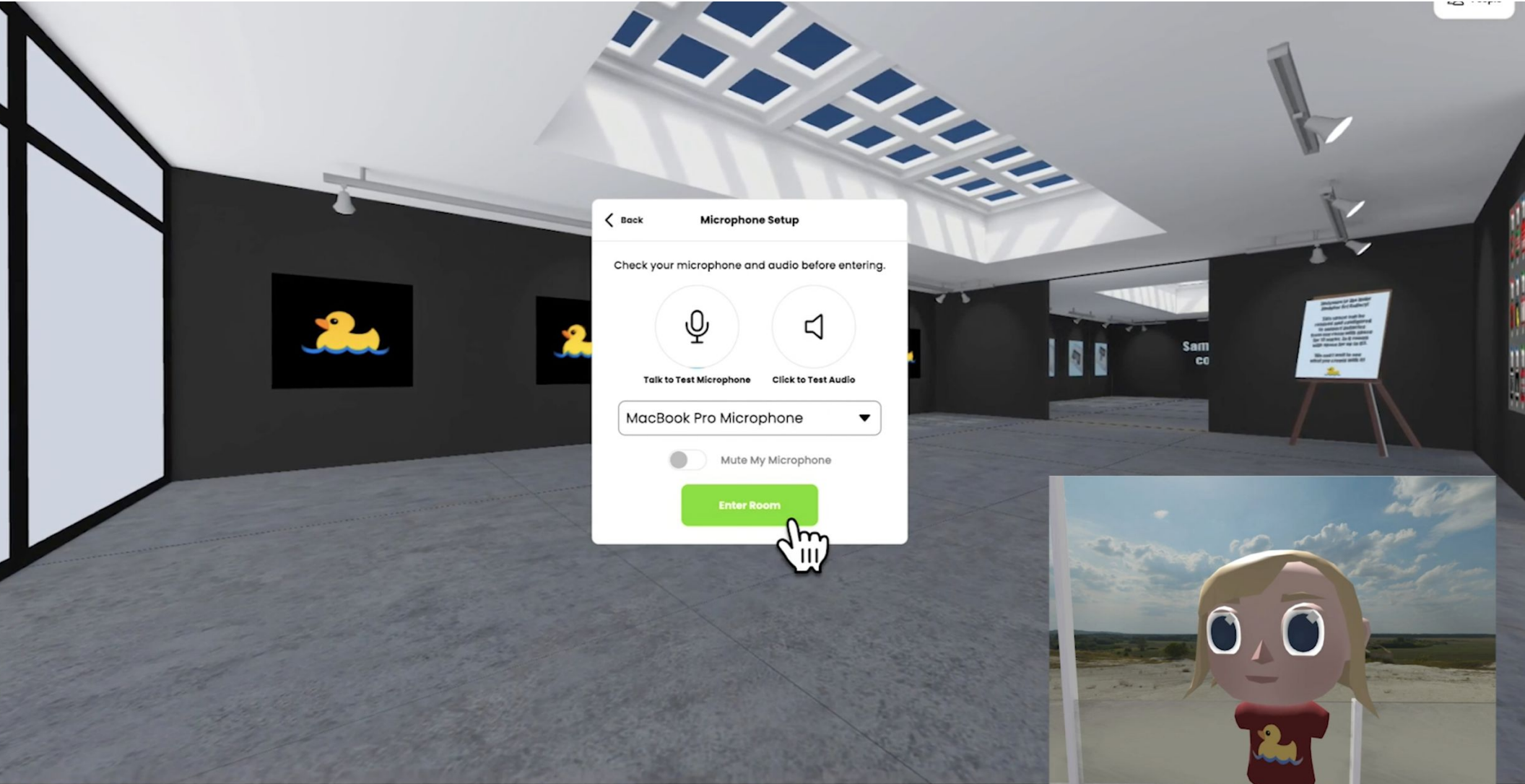
More



Invite

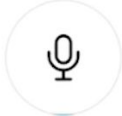


Chat




← Back      **Microphone Setup**

Check your microphone and audio before entering.



Talk to Test Microphone

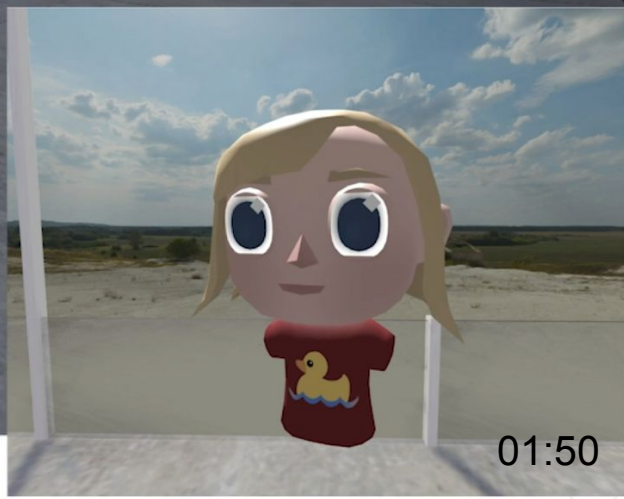


Click to Test Audio

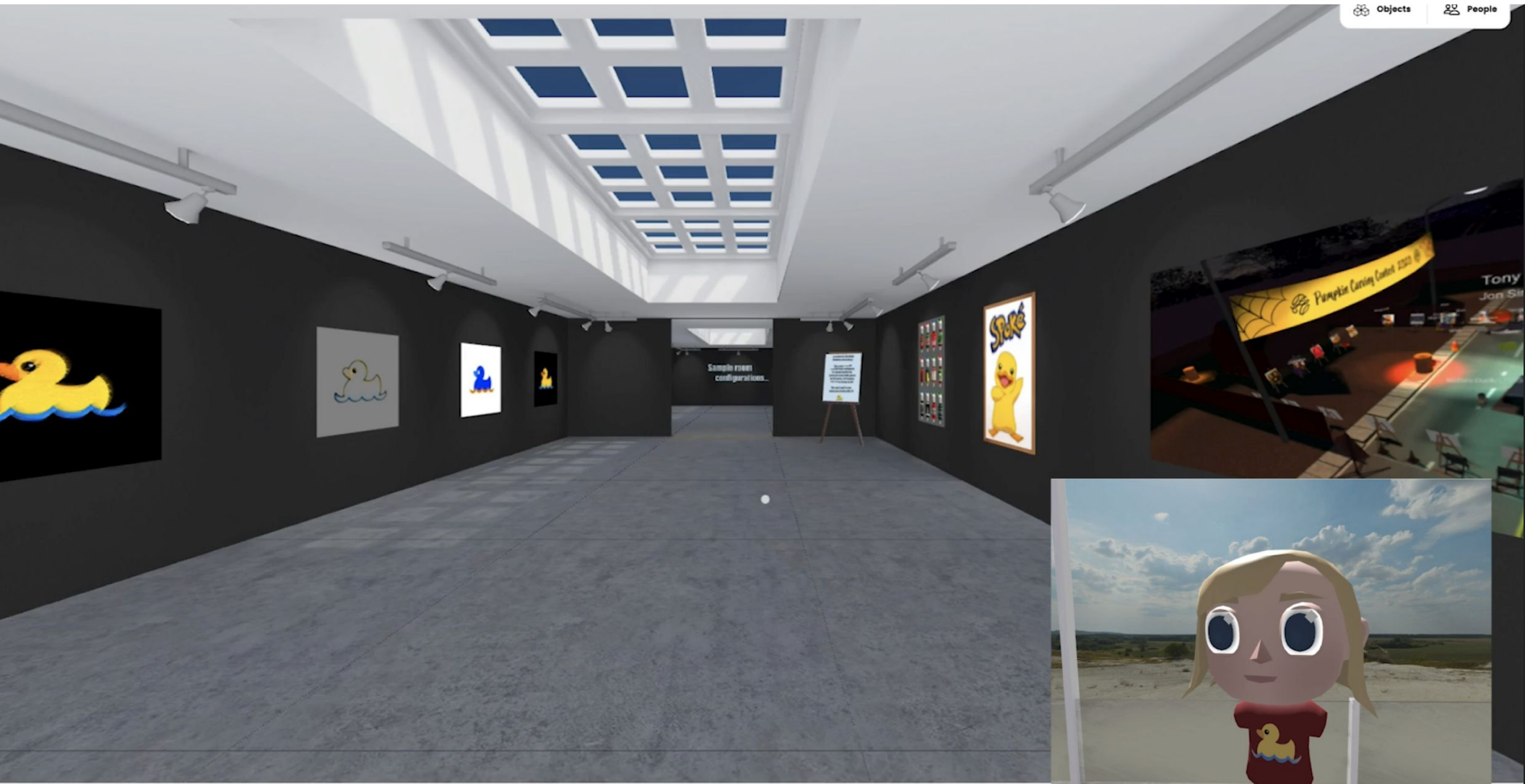
MacBook Pro Microphone ▼

Mute My Microphone

**Enter Room**



More



Invite



Voice



Share



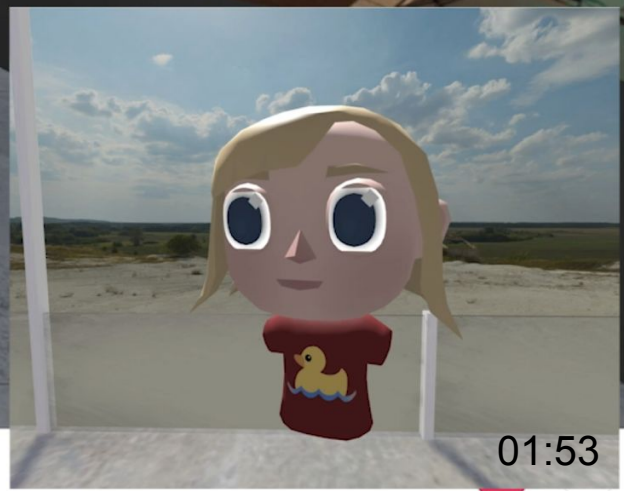
Place



React



Chat



01:53

Leave

More



# Hartlaubs-18733

Daria

Robert

anselm  
Ellen

phil

Kevin

Dom

Robin

Liv





Feature Prioritization

01:58 | 24:11

⏪ ⏩ ⏸ 🔊 📺 📄 📧

01:59

You are muted. Click or press M to un-mute.



THIS ONE SMALL WORK ANSWER IN  
AUSTIN THAT WE HAVE PEOPLE  
FROM THE NETHERLANDS COSTA  
RICA FROM ZIMBABWE FROM I  
TALY IT BLOWS MY MIND STILL  
EVEN IF YOU'RE JUST



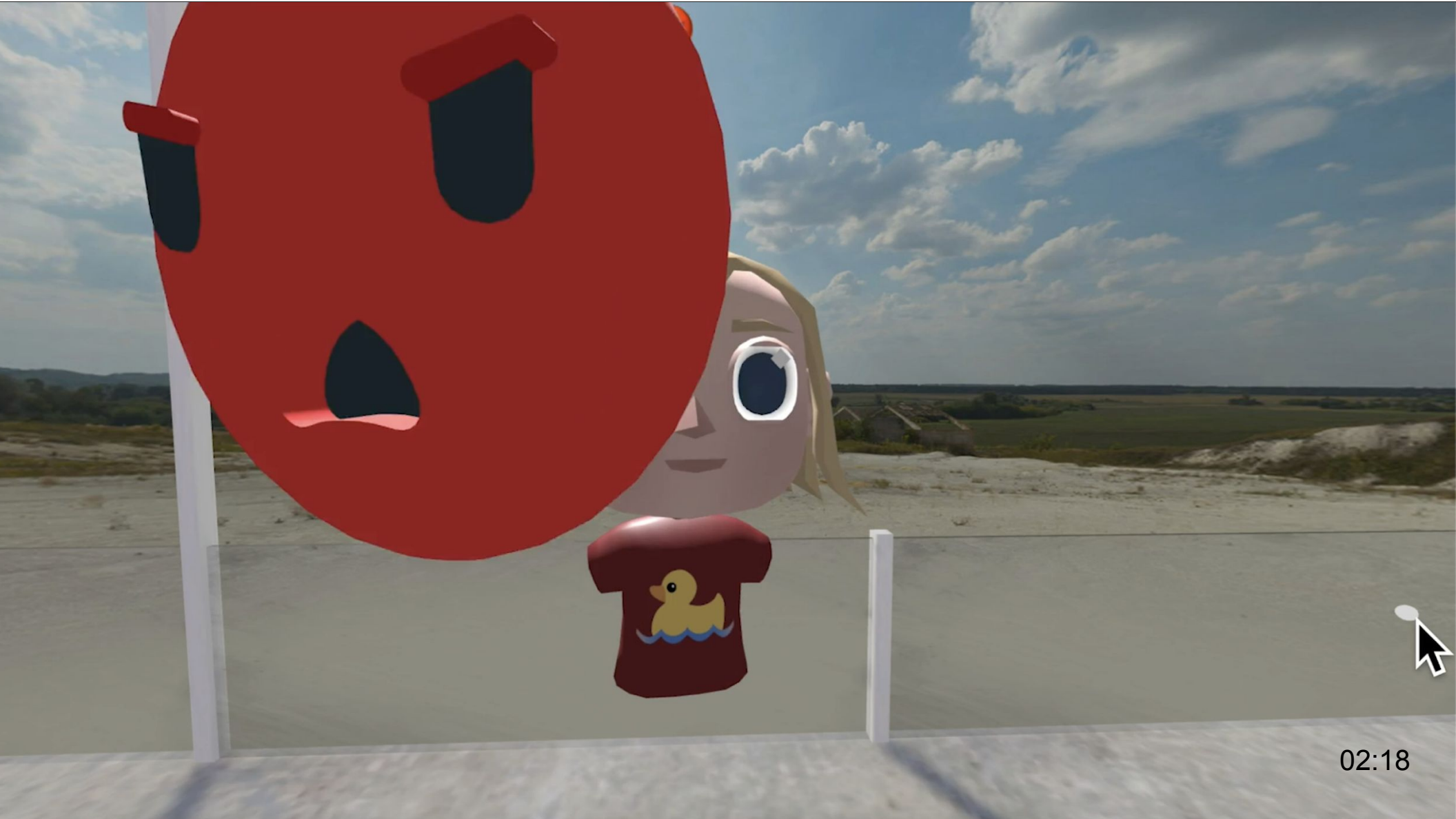
#WCATX  
austin.wordcamp.org/2020  
twitter - @wordcampaustin  
instagram - @wordcampaustin

Bruce Chamoff Ben Boomer - DreamHost Nicks Quirk - for...  
Sand Batik

02:00

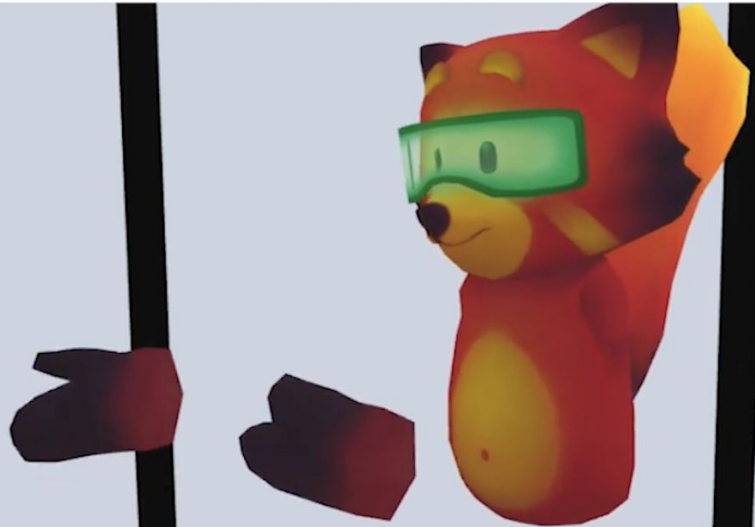






02:18

# No downloads or accounts needed



02:30

Leave More

**Invite**

Room Link  
 [Copy](#)

Room Code  
 [Copy](#)

Enter code on [myhubs.info](https://myhubs.info)

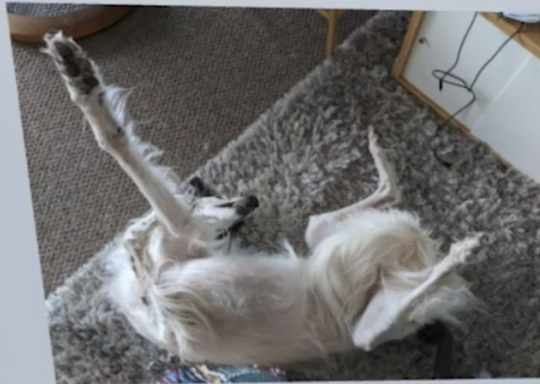
Embed Code  
 [Copy](#)

# No downloads or accounts needed

+ Hey Liv, want to meet in Hubs? <https://hubs.mozilla.com/9Qnz9MJ/>



**windhounds rule!!**



# Works across devices

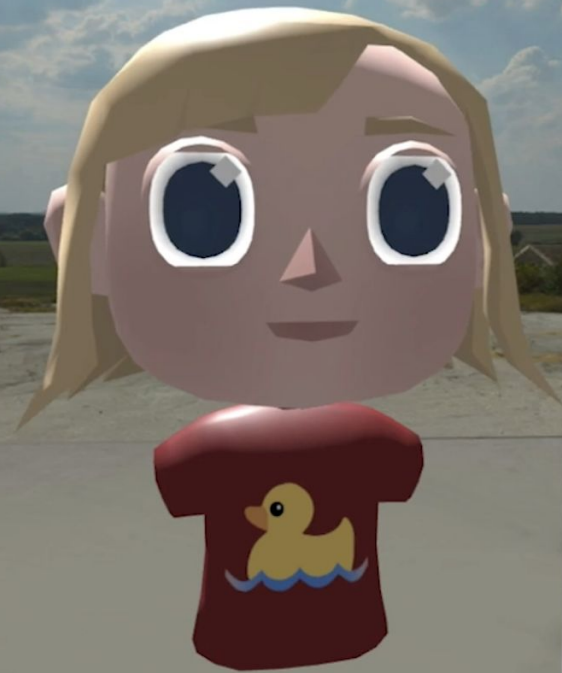


02:47

---

# **Hubs vs Video Chat**

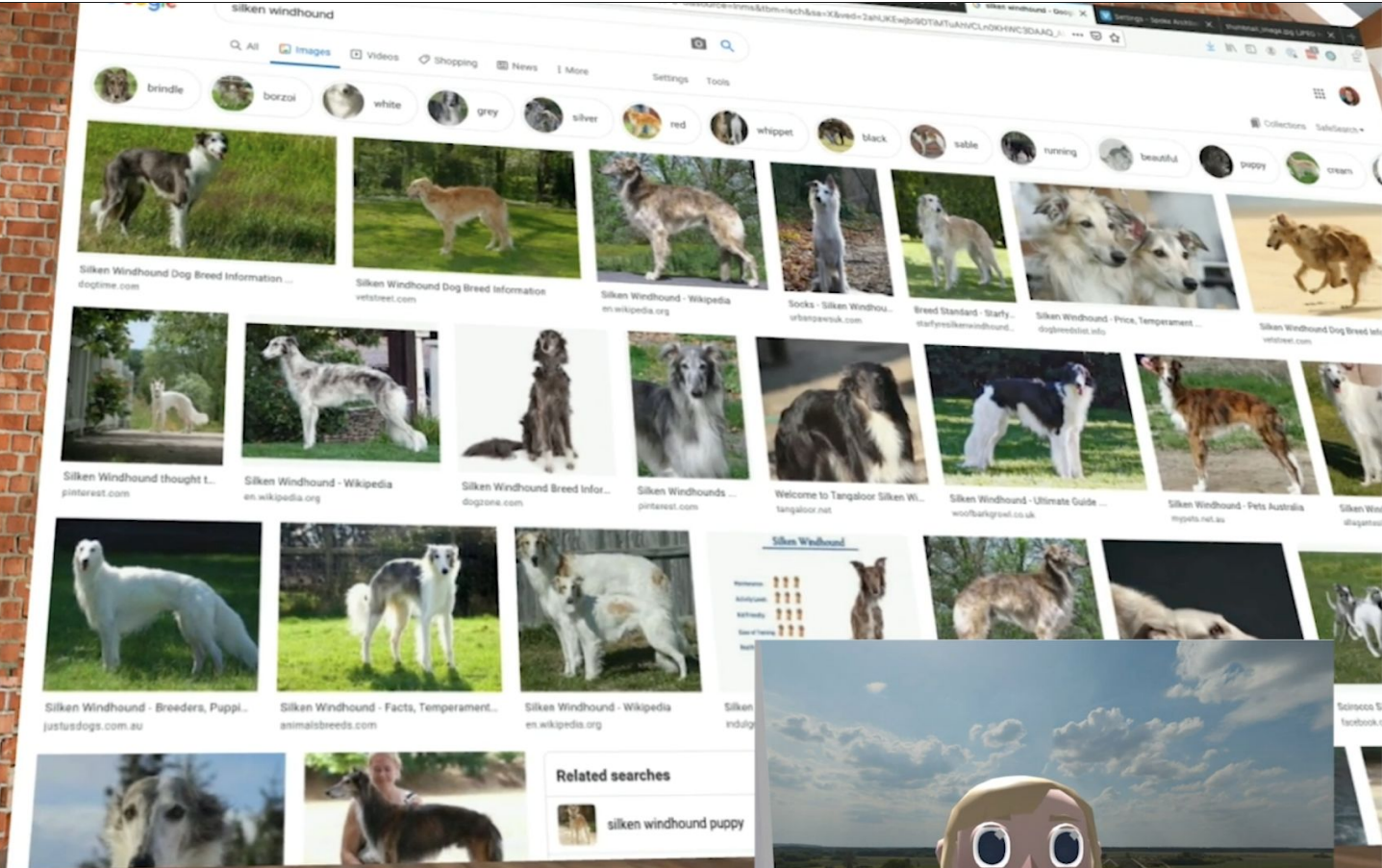
# Avatar-based communication



03:10



# Co-presence





# Spatial audio



REM5VR - Day by Day Gallery

03:50



Narratify - House in the forest

04:20



Search Scenes...

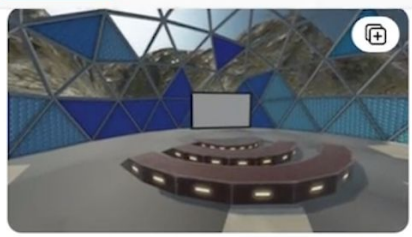


Custom Scene

Made with Spoke | Report Issue

Google Poly Sketchfab **Scenes** Avatars GIFs

**Featured** My Scenes



**Outdoor Meetup**  
Hubs Team



**Snowed In**  
Hubs Team, 'Low Poly Winter Scene' by <https://sketchfab.com/Edw>



**Hubs School v1.0**  
Hubs Team



**Holiday Party 2020 - Christmas Version**  
Hubs Team



**Winter Cheer**  
Theanine (@theanine3d)



**Holiday Party 2020**  
Hubs Team



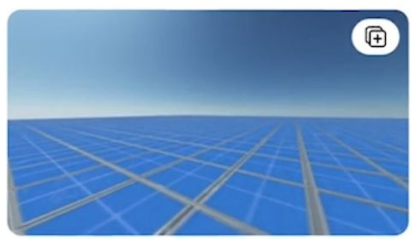
**Maze Challenge**  
Hubs Team



**Round Table Room**  
Hubs Team



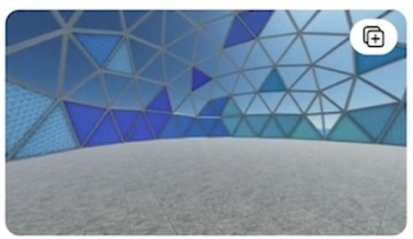
**Cudillero Diorama**  
Hubs Team



**Wide Open Space**  
Hubs Team



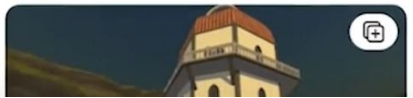
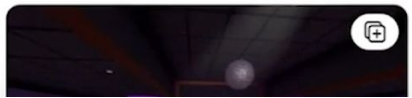
**River Island**  
Hubs Team



**Outdoor Dome**



**Museum of Fossilize**





[hubs.mozilla.com/spoke](https://hubs.mozilla.com/spoke)

Hierarchy

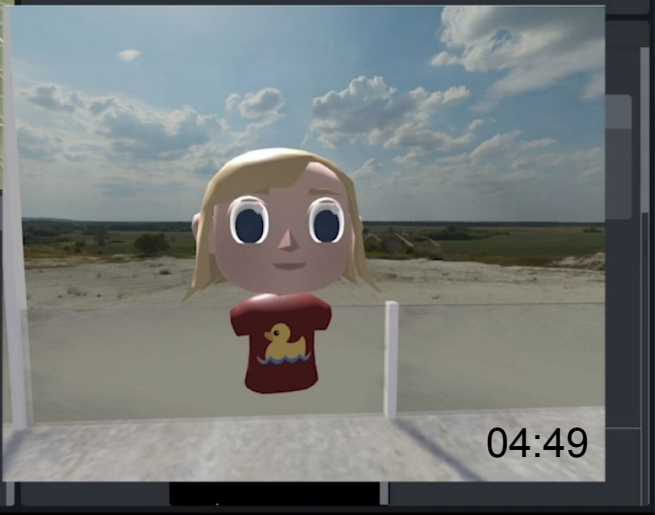
- Crater
  - Skybox
  - Directional Light
  - Spawn Point
  - Floor Plan
  - Terrain\_Crater1.glb
  - Floor\_Plat\_4x4\_Base 1
  - Floor\_Plat\_4x4\_Base 2
  - Floor\_Plat\_4x4\_Base 3
  - Floor\_Plat\_4x4\_Base 4
  - Floor\_Plat\_4x4\_Base 5
  - Floor\_Plat\_4x4\_Base 6

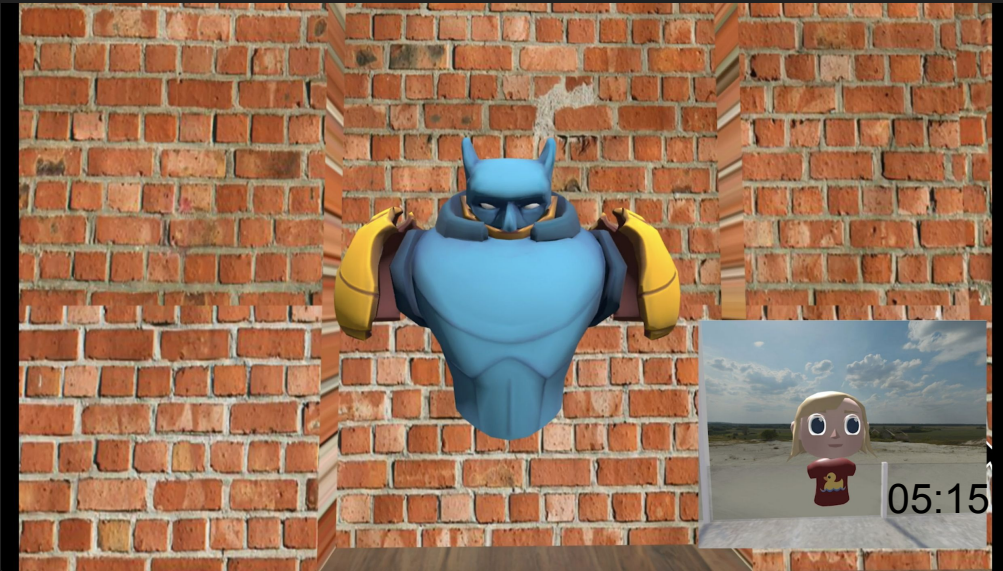
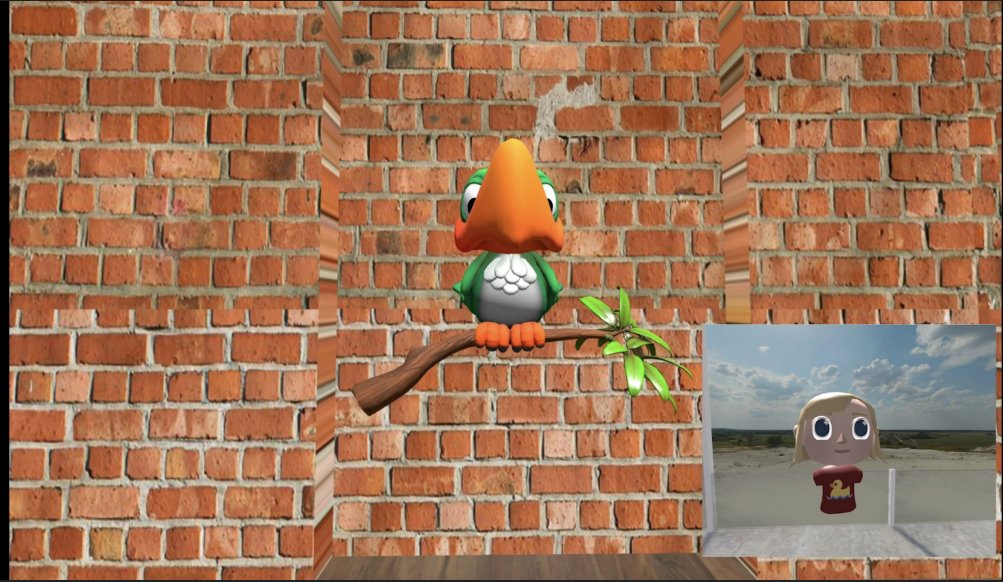
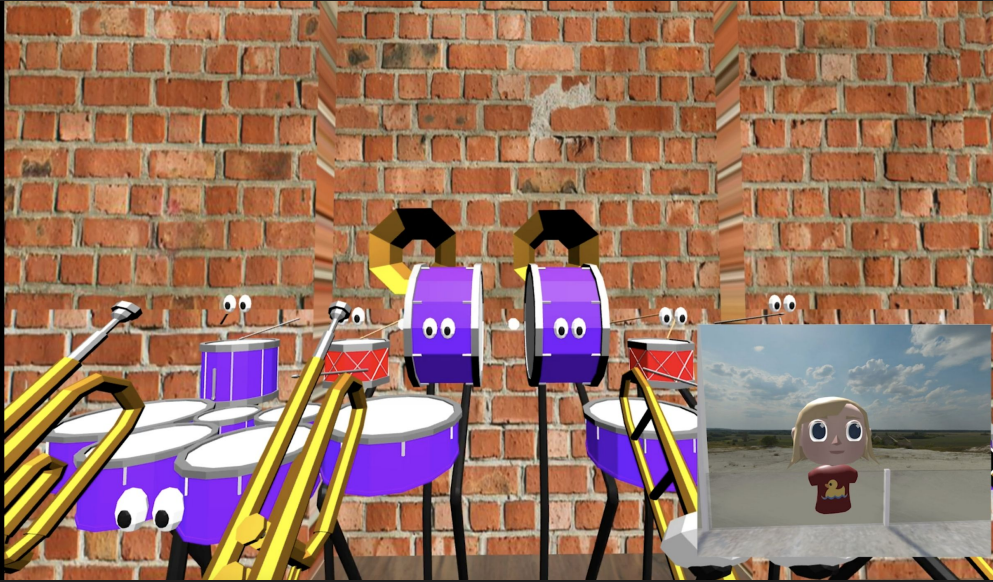
Assets

Architecture Kit

Search pieces...

Elements	Tags								
My Assets	All								
Architecture Kit	Floor								
Sketchfab	Platform								
Google Poly	Door								
Bing Images	Wall								
Bing Videos	Window								
Twitch	Trim								
Tenor GIFs	Roof								
	Pillar								





# Recommended max 25 guests

Can be increased to 50





three.js r125

### Learn

[documentation](#)  
[examples](#)  
[editor](#)

### Community

[questions](#)  
[discord](#)  
[forum](#)  
[slack](#)  
[twitter](#)

### Code

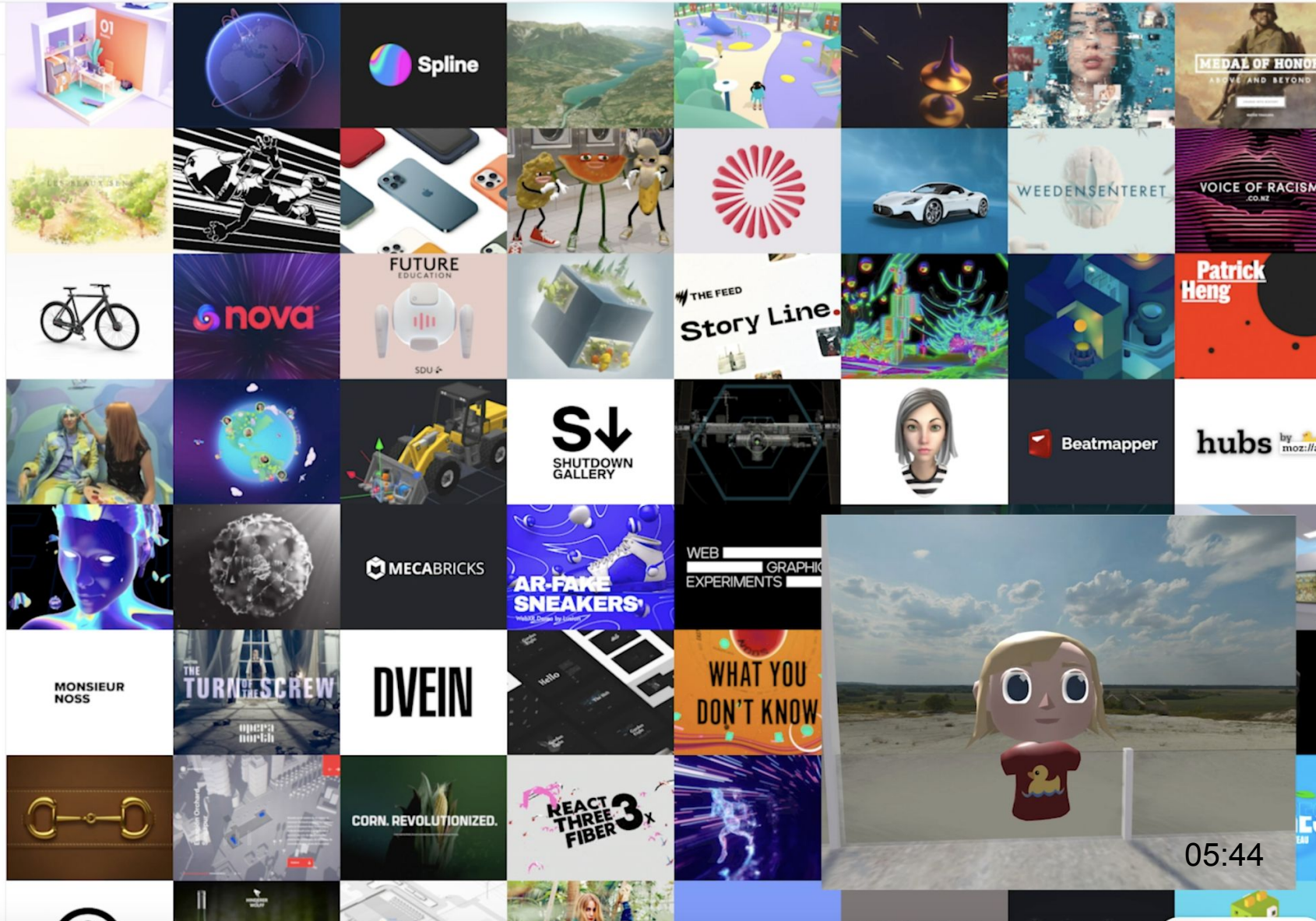
[github](#)  
[download](#)  
[devtools](#)

### Resources

[Three.js Fundamentals](#)  
[Three.js Journey](#)  
[Learn Three.js](#)  
[初めてのThree.js](#)

### Merch

[T-Shirts](#)





# mozilla / hubs

Watch 82 Star 994 Fork 380

Code Issues 636 Pull requests 30 Discussions Actions Projects 1 Wiki Security Insights

master 105 branches 0 tags

Go to file Code

	robertlong Merge pull request #3808 from mozilla/fix/more-menu-scrollbar	5673bcc 5 hours ago	9,654 commits
.circleci	Use npm run deploy-storybook		4 months ago
.github	Tweak bug report template		2 months ago
.storybook	Add active locale item to storybook toolbar		last month
.vscode	virtual-gamepad-controls component for mobile 2d locomotion (#9)		3 years ago
admin	updated banner link and language		16 days ago
doc	Remove whitelist/blacklist terms from code and docs		8 months ago
habitat	Move from node-sass to sass and upgrade webpack		6 months ago
scripts	Merge pull request #3561 from mozilla/bp-test-stage		24 days ago
src	Fix more menu overflow		5 hours ago
test/unit/utlis	Add tests for getSanitizedComponentMapping.		2 years ago
			2 months ago
			10 months ago
	off linting time		3 months ago
			2 months ago
			last month
.htmlhintc	Upgrade some minor dependencies to shut up npm audit		2 years ago

## About

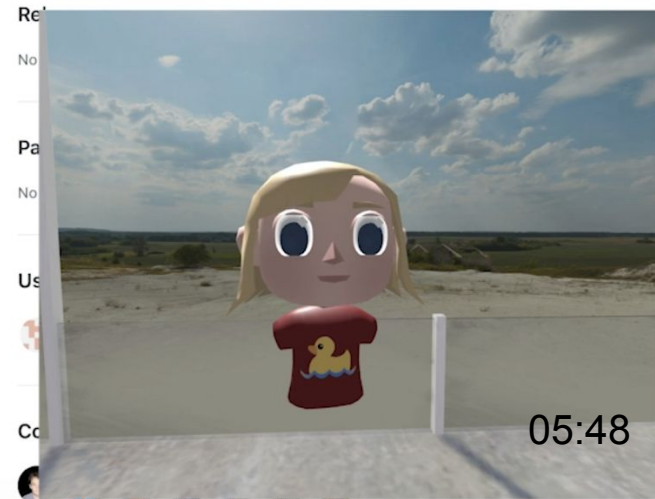
Duck-themed multi-user virtual spaces in WebVR. Built with A-Frame.

[hubs.mozilla.com](https://hubs.mozilla.com)

webrtc webvr aframe

Readme

MPL-2.0 License



# github.com/mozilla/hubs



### Introducing Hubs Cloud

Hubs Cloud creates and manages all of the AWS resources needed to host your own immersive spaces from your company or organization's own account. Bring your own domain or use Route53 to create a new site, running on a single EC2 instance or scaled up to multiple servers for greater system-wide concurrency. Easily customize your platform with your own branding, upload your own 3D content, or select from the vast array of avatars and scenes licensed under Creative Commons for the Hubs platform.

#### Get it today on the AWS Marketplace

Get Hubs Cloud Personal

Get Hubs Cloud Enterprise

#### Do-It-Yourself Events

With Hubs Cloud, you can enable your own virtual events infrastructure by tailoring your deployment to meet your needs.

#### Self-Hosted Infrastructure

With Hubs Cloud, your deployment is on your own organization's infrastructure, keeping your sensitive data within an AWS region you own.

#### Usage-Based Pricing

Your cost to run Hubs Cloud is based on the size of your deployment and storage used. All resources are on AWS, so you'll get visible cost savings at every step of the way.

# hubs.mozilla.com/cloud

Quick Start Guide



**Open**



07:09

**Accessible**



07:13

**Delightful**



07:17

**Developers**



**Community Organizers**



**DIY Artists**



**3D Modeling Professionals**



**Educators**



**& More!**



DEVELOPMENT +

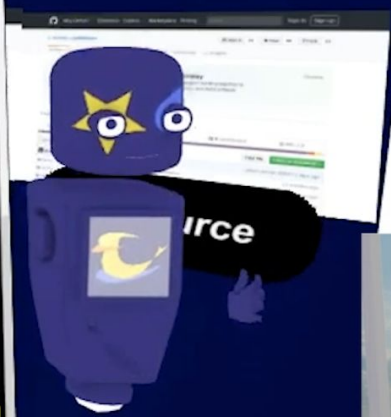
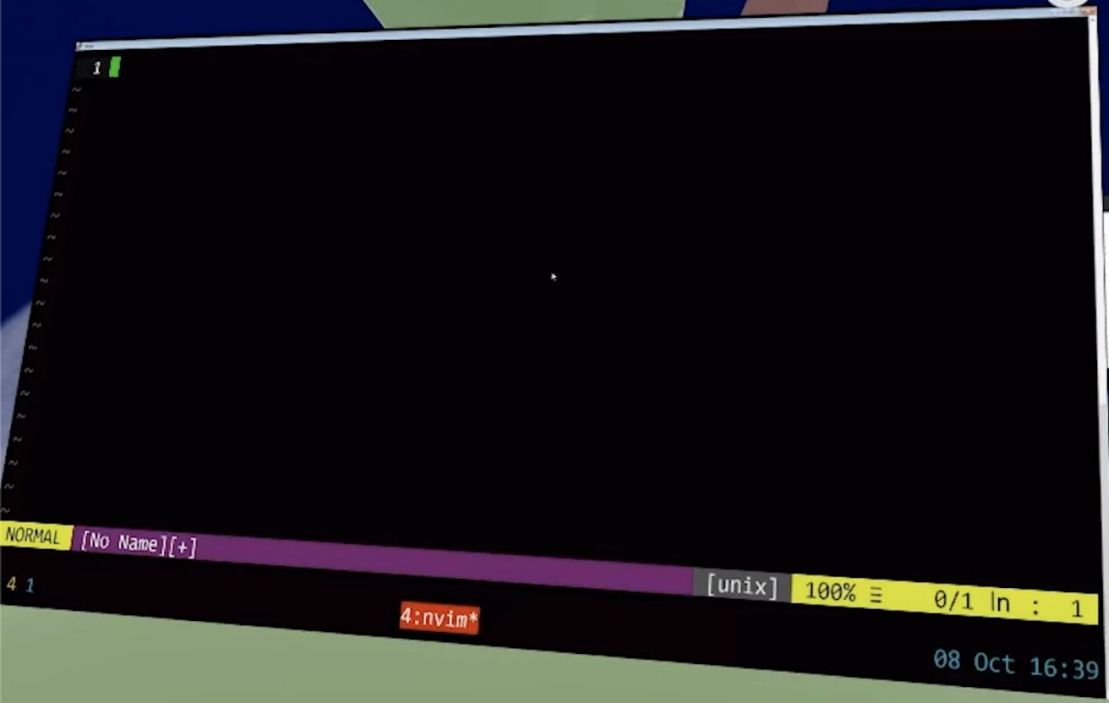
- # dev-general
- # dev-avatars
- # dev-ops
- # dev-discord-bot
- # dev-webrtc
- # dev-spoke
- # dev-extensibility
- # dev-user-experience
- # dev-hubs-cloud
- # dev-performance
- # dev-design
- # dev-channels-opt-in
- # dev-api-testing-opt-in
- # dev-api-testing-interested
- # dev-api-alpha





- feel free to enter questions  
the chat

# gfodor





Jordan Elevons - Underwater classroom



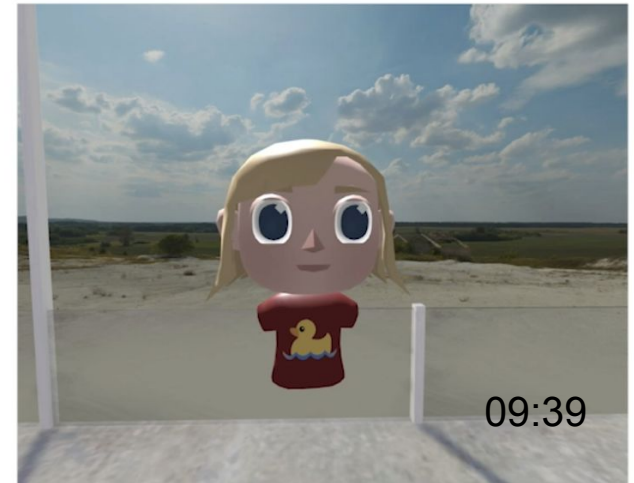
08:47

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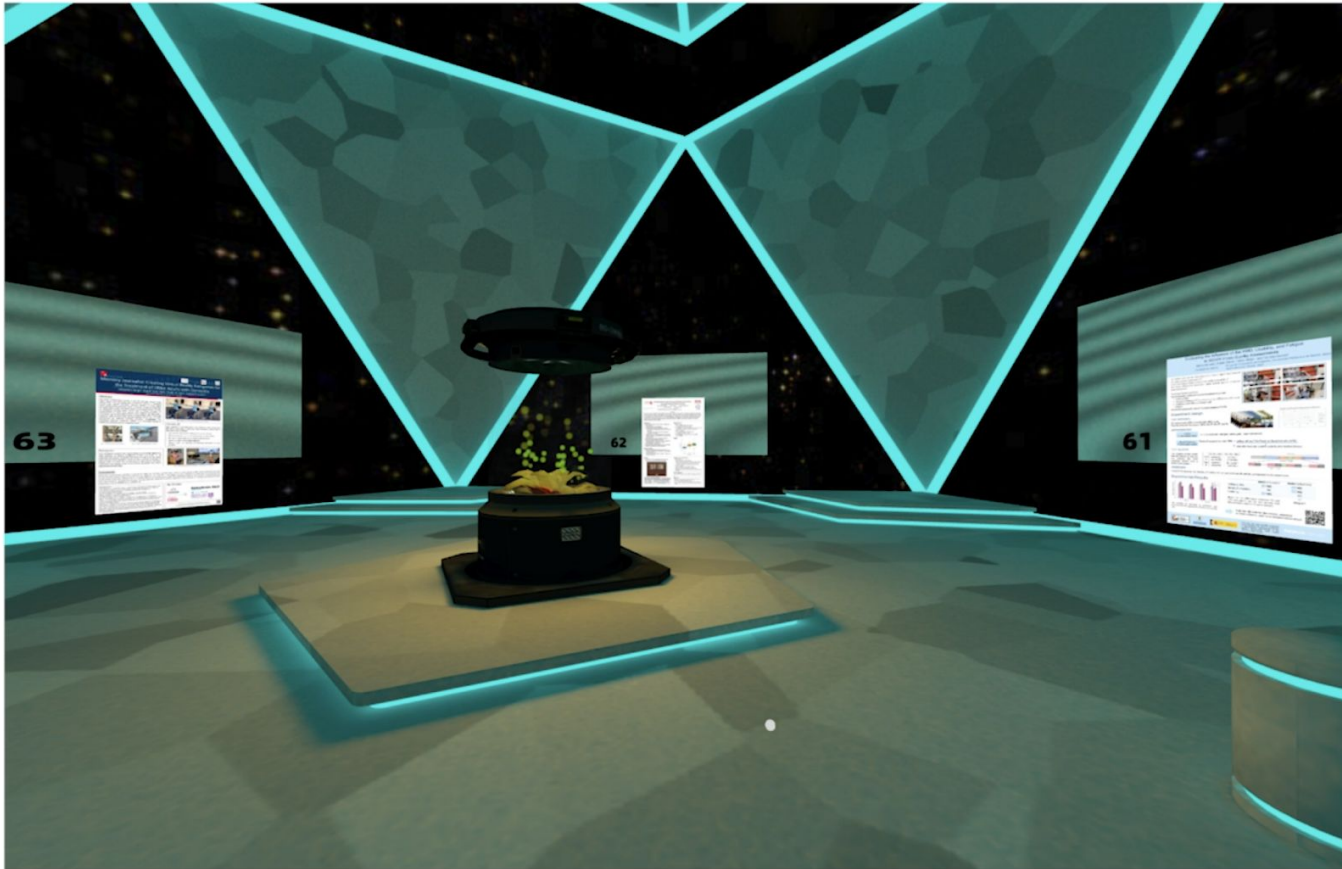
# **Hubs During COVID-19**

**hubs**  
**cloud**

2020  
**IEEE VR**  
ATLANTA

The logo icon for IEEE VR Atlanta 2020, featuring a stylized eye or camera lens symbol above a series of horizontal lines that resemble a circuit board or a stylized 'H'.













## Posters from a Social Distance

**apartposters.com**

...arch, a bunch of us at **Paradowski** started creating posters as a way of processing the COVID-19 Pandemic. We decided to invite other artists to join us and opened an online store, with 100% of the profits from print purchases going directly to the **World Health Organization's COVID-19 Solidarity Response Fund**.

After an amazing amount of support and participation — hundreds of artworks sold and more than \$5,000 raised — we built a virtual gallery to show the work and interact with one another.

The store is closed, but the gallery will live on indefinitely. Thank you to every person who submitted a design, purchased something, or spread the word. You made it possible to be a part of something meaningful, even while we're apart.

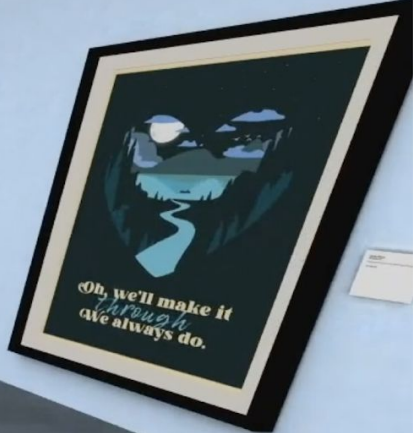
[Visit Virtual Gallery](#)

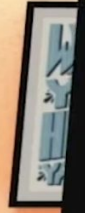




ance

Helena Gou...





Small white text block, likely a caption or informational note.



EST  1977

**PARADOWSKI**

DESIGN FOR ALL BRANDKIND

**Art**

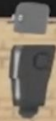
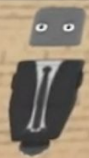


14:14



Saint Motel - New World

14:18



14:23

Saint Motel - New World





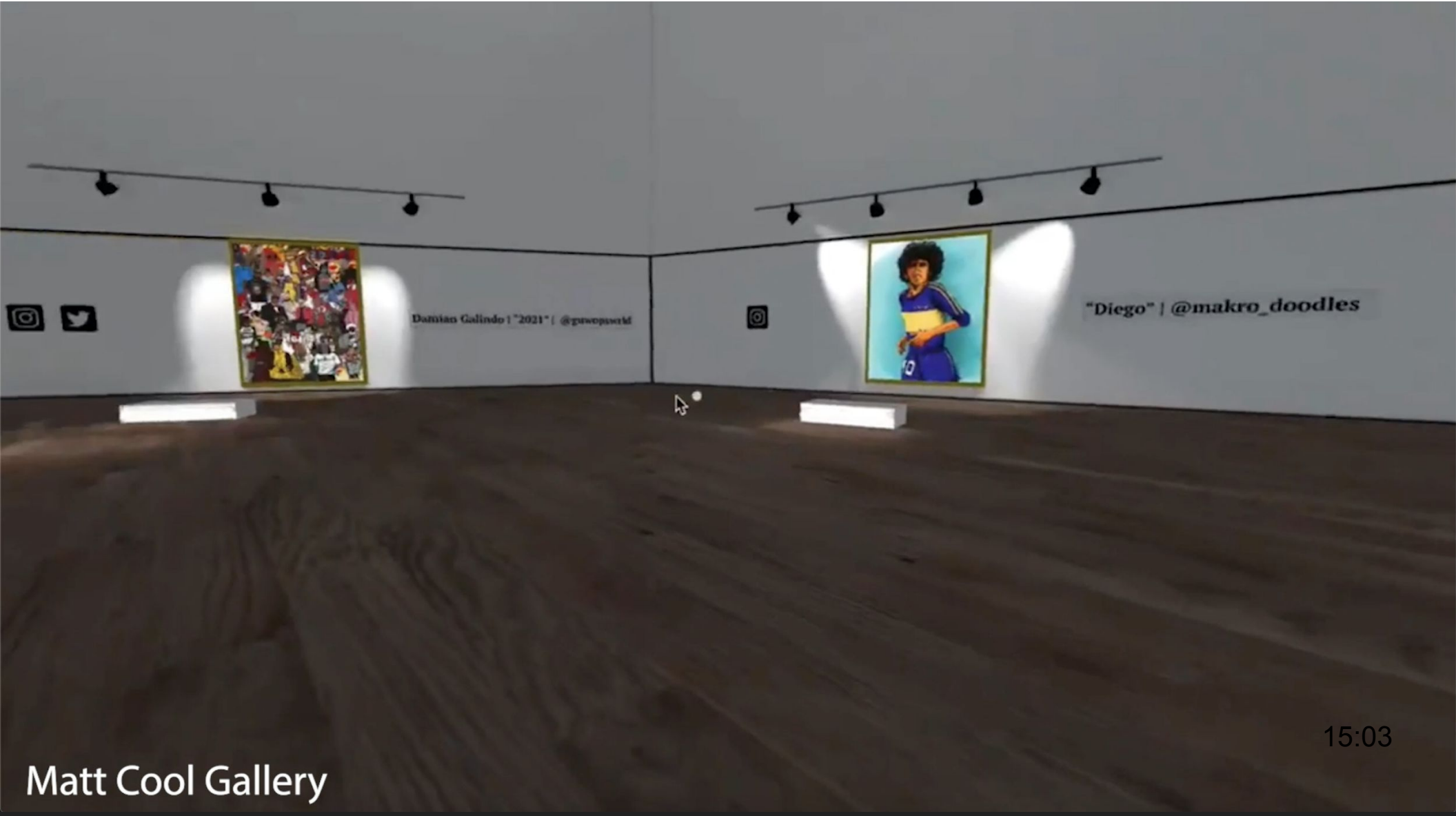
Brendan Bradley - Future Stages

14:35



14:41

JETTISON@FUTURESTAGES



Damian Galindo | "2021" | @grwopsschl

"Diego" | @makro\_doodles

Matt Cool Gallery

15:03



makro\_doodles

Follow



297 posts

1,208 followers

987 following

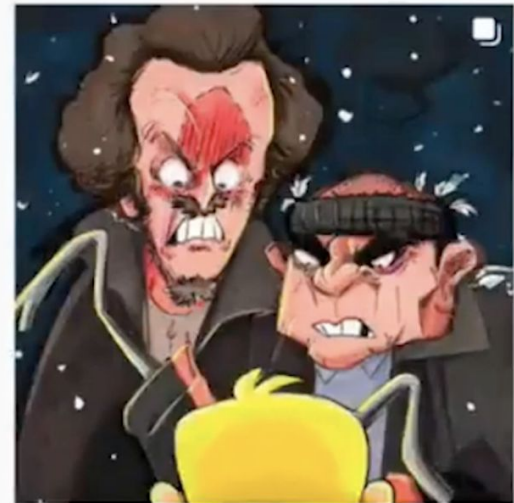
Makrogiannakis Manolis

It's time to d-d-d-doodle!

[society6.com/makro\\_doodles](https://society6.com/makro_doodles)

POSTS

TAGGED



15:15

Matt Cool Gallery

# Celebrations



15:39

Share

11 1

# Remembrance



REM5VR



+ Send to room...



60 FPS

Share

11 1

USA DAILY COVID DEATH COUNT:

4,406

JANUARY 12, 2021



REM5VR

+ Send to room... ? 60 FPS

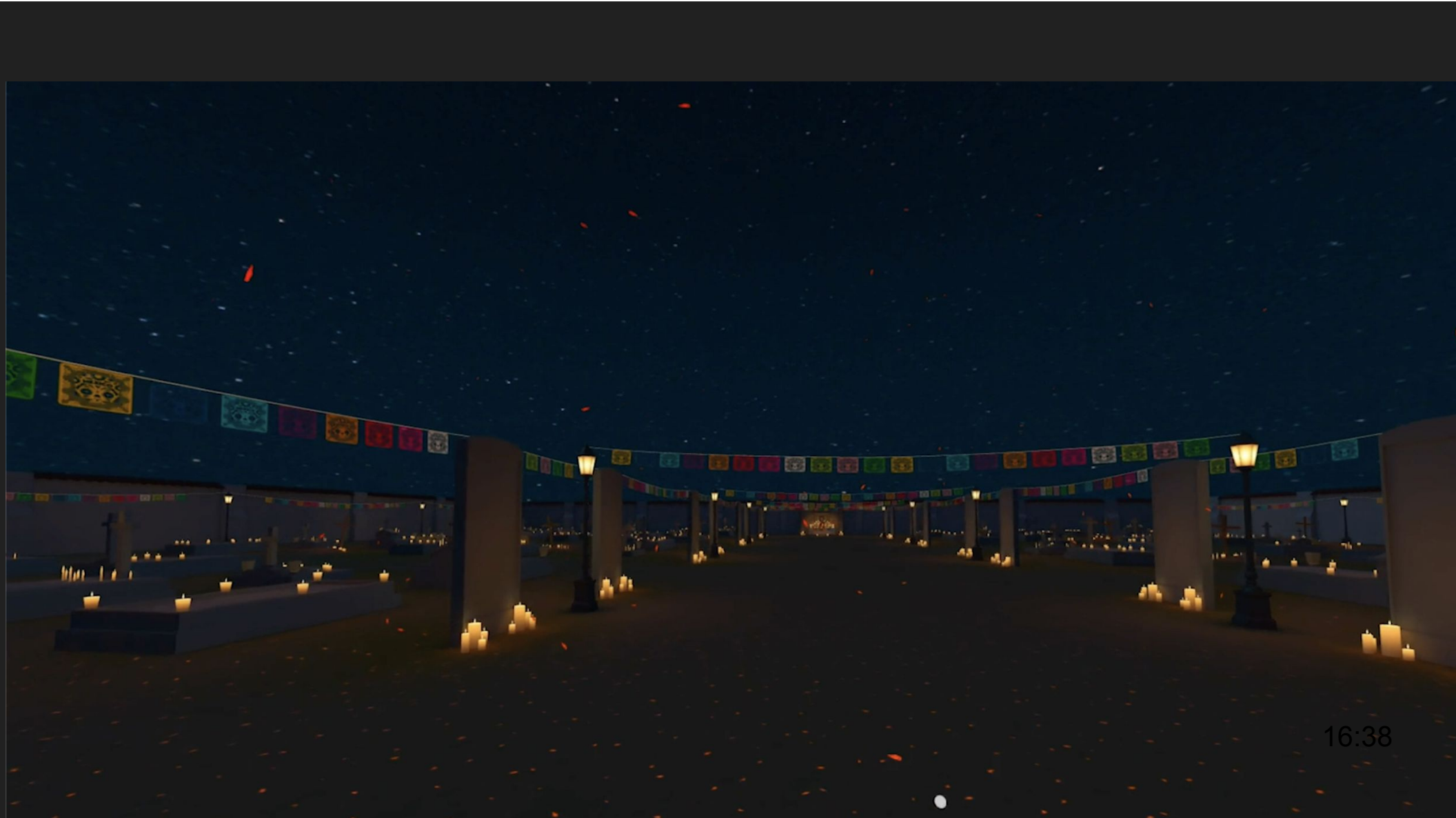






16:36

InnovacionEdTec team (Tec de Monterrey) - Día de Muertos



16:38

# Education



16:45



Pau Guardiola - Universidad Católica San Antonio de Murcia



**LA CAMPESINA**  
**OLÍMPICA**  
**SOFÍA TORRES**, profesora de la Facultad de Deporte de la UCAM, con sus gafas de realidad virtual impartiendo en directo una clase práctica sobre volea a sus estudiantes, que está en la sala virtual. Para acceder, siguiendo sus indicaciones desde casa. Esta clase la desarrollará en su estudio de la experiencia de la UCAM.

# UCAM, deporte y tecnología

**LA UNIVERSIDAD CATÓLICA DE MURCIA INNOVA**  
 La UCAM incorpora herramientas de última generación y desarrolla aplicaciones para docencia e investigación

docencia, investigación y competición. La realidad virtual ofrece posibilidades como le ofrece en la investigación y los profesores se están sacando el máximo potencial a esta tecnología.

«Cada aplicación de las últimas tecnologías se pueden ver en el campo de la investigación y los profesores se están sacando el máximo potencial a esta tecnología».



**PROFOOTBALL**

**INICIATIVA**

Junio de 2020. Sofía Torres, catedrática de volea en los últimos 20 años y profesora de la UCAM, desarrolla una clase práctica en el Campus de Las Torres. Junto a sus compañeros Paco Sagado y Martín Marañón. Sus alumnos, del Grado en Ciencias de la Actividad Física y del Deporte, asisten a la clase, pero no están en la Universidad. Cada uno de ellos se encuentra en diferentes puntos de España siguiendo la clase desde casa. Sin embargo, profesores y estudiantes están conectados en la misma sala virtual. Sus avatares se mueven como si se tratara de un espacio físico, se acercan a la pizarra y ven los diferentes detalles.

**INVESTIGACIÓN CSD**

**DEL PREVENT**  
**MÁS DE 100 ALUMNOS PROFESIONALES**  
 Incluye a más de 100 alumnos profesionales entre los que se destaca a LaLiga, Liga, La Serie A o la Premier. La idea es conocer cómo se diseñan los entrenamientos y la relación que puede haber con la lesión de lesión, que supone el 37% en el fútbol y que genera unos altos costes.

**DE BATA ROJA**  
**VIDA SALUDABLE, ENVIAR ACTIVO**  
 El principal objetivo es investigar a través de proyectos coordinados con otras universidades, promover un estilo de vida activo y saludable, así como el desarrollo de acciones para la promoción del empoderamiento activo en la población mayor española.

Se trata de una prueba que la Unidad de Experiencia de la UCAM, liderada por Pau Guardiola, ha preparado para comprobar las posibilidades que la realidad virtual ofrece a día de hoy a la enseñanza universitaria y preparar el terreno para el futuro. El proceso de transformación digital en el que se encuentra la Universidad Católica de Murcia incluye también una conexión a través de WiFi 6, renovación de ordenadores o utilización de servidores físicos y en la nube entre otros aspectos.

Terminado en cuenta el papel que juega la UCAM en el deporte, es evidente que este compromiso se extiende a todo el ámbito deportivo en las áreas del deporte en las que trabaja la Universidad.



**UCAM Murcia CB** ha utilizado tecnología GPS para obtener datos en tiempo real de los entrenamientos de los jugadores.

**9,25**  
 Valoración media de los alumnos UCAM tras la primera clase de realidad virtual.

**3D**  
 Tecnología innovativa, alumnos y profesores consiguen en entornos virtuales.

**5G**  
 Tecnología que el deporte para la expansión de tecnologías innovadoras.

**Marina Jiménez**, catedrática de volea, realizando un primer curso de volea en el Centro de Investigación y Alto Rendimiento de la UCAM.



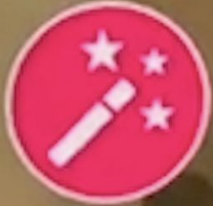
17:01



invite

structure

1



Create



Greg Dorsainville - NYU Grossman School of Medicine



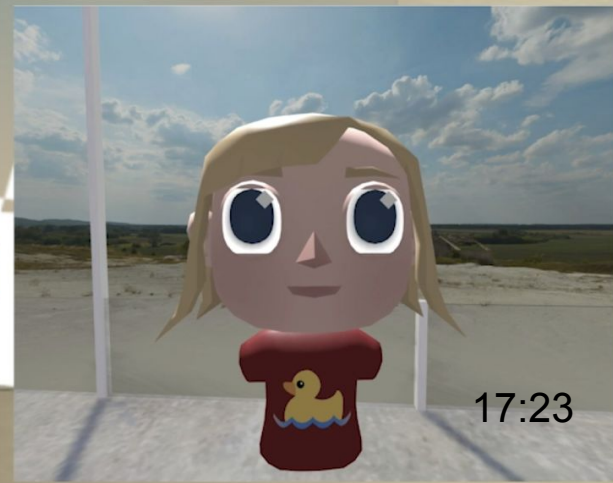
WELCOME TO  
GWU FESTIVAL OF ANIMATION  
SPRING 2020

**AGENDA**

6:00 PM ..... BOOKS OPEN  
7:00 PM ..... NOTE COMPLETE  
8:00 PM ..... ANNOUNCEMENTS  
9:00 PM ..... FESTIVAL ONE

WELCOME TO  
GWU FESTIVAL OF ANIMATION  
SPRING

GWU SCHOOL OF ENGINEERING  
& APPLIED SCIENCE



George Washington University - Festival of Animation

# Human Motion Capture and Analysis Laboratory (MOCA)



# Accurate 3D Human Body Reconstruction Shape-Based Body Composition



**Non-Rigid Motion Tracking Using Local Coordinate Regularization**  
Shi Li, Cheng Zhao, Xiao Xiao, James K. Hodgins

**Non-Rigid Regularization**

- Minimize the Embedded Energy
- Local Coordinate Regularization
- Adaptive Selection of Reference Frame

**Results**

- Local Coordinate Regularization and Adaptive Reference Frame
- Tracking Accuracy
- Comparison with Other Methods
- Challenging Motions

**Shape-Based Correspondence**

MOCA received an NSF MRI award in 2013 to develop a novel instrument for large-scale, real-time, dense 3D motion capture of dynamic scenes. This instrument will enable measuring, in real-time, dense 3D scene-structure and color-appearance information over at least a 200 m3 volume at sub-cm resolution. This gives users the ability to track, at unprecedented scale and resolution, scene appearance, 3D structure and their temporal evolution. In a broad range of fields, knowledge of the evolution of ground truth 3D structure and scene appearance is invaluable for validating scientific theories.







Share

34

21

U FoA Team

en

Announcements

Juman Byun

bByun

Menu

Vote for your favorite Room

Computer Animation

Game Design and Storytelling

Lake-Duck-11898



17:33



60 FPS

George Washington University - Festival of Animation



George Washington University - Festival of Animation

# Events



VRTO Virtual & Augmented Reality World Conference & Expo



VRTO Virtual & Augmented Reality World Conference & Expo

- Need context for social interaction
- Need ice-breaking activities
- Need to motivate people to take action
- Need to create realistic, engaging environments...



VRTO Virtual & Augmented Reality World Conference & Expo

18:08

Trash



BREAKING  
NEWS

## MONSTER CHICKEN ATTACKS

STATE OF EMERGENCY ISSUED! RUN FOR YOUR LIVES!



VRTO Virtual & Augmented Reality World Conference & Expo

THE 12<sup>TH</sup> ANNUAL  
CRAFT LAKE CITY®

>> VIRTUAL <<

DIY®  
DO-IT-YOURSELF

Festival

PRESENTED BY  
**HARMONS**  
NEIGHBORHOOD GROCER

AUGUST 7, 8 & 9



18:10

Trash

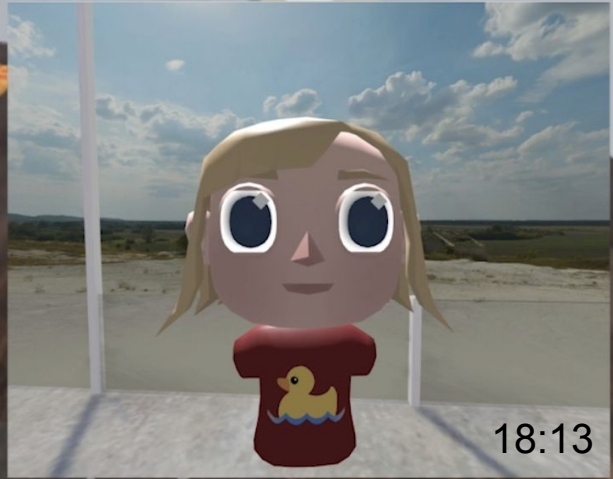
Craft Lake City



34



Share

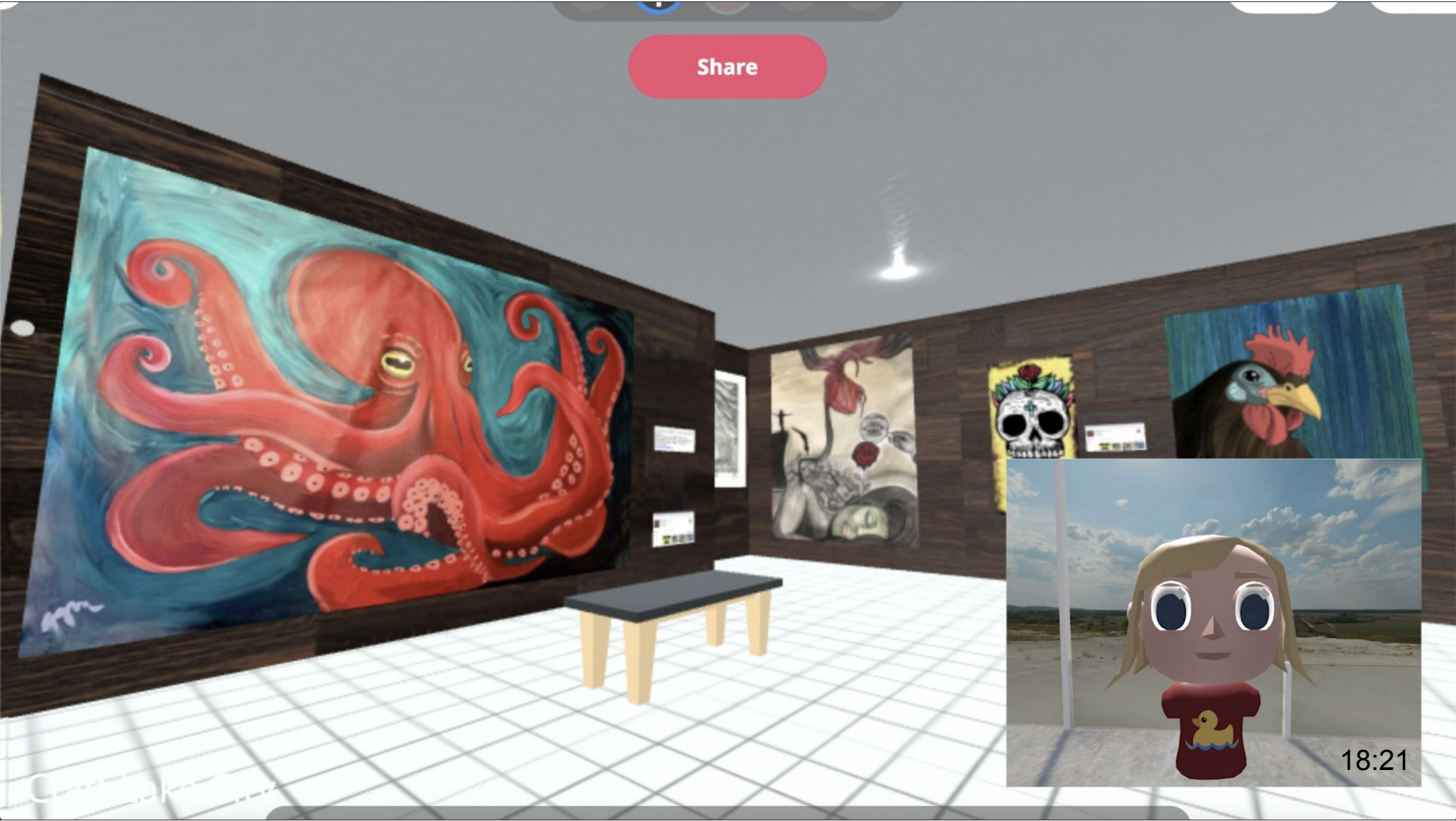


Trash

Craft Lake City + Send to room...



Share



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# **Community Strategies**

**Make it easy**



18:57

Introduction ▼

- Welcome
- Getting Started With Hubs
- Building Scenes with Spoke
- Creating Custom Avatars
- Hosting Events in Hubs

Hubs Documentation >

Spoke Documentation >

For Creators >

For Developers >

Hubs Cloud >

Hubs Cloud AWS >

Hubs Cloud DigitalOcean >

# Welcome to Hubs

EDIT

Hubs is a virtual collaboration platform that runs in your browser. With Hubs you can create your own 3D spaces with a single click. Invite others to join using a URL. No installation or app store required.



- Who is Hubs for?
- Customizing Hubs
- What is Spoke?

## Who is Hubs for?

Hubs is for anyone who wants to connect with others remotely! It's a great way to bring communities together in a shared virtual space.

Host a conference, teach a class, showcase art, or just hang out with friends. Hubs makes it easy to connect and share images, videos, 3D models, and more. With Hubs' spatialized audio you can have

Search all discussions [New] [Top: All] [Answered] [Unanswered]

New discussion

Categories

View all

- Art Questions
- Avatar Questions
- General Questions & Discussion
- Hubs Cloud Questions
- Spoke Questions

**Most helpful** Last 30 days

robinkwilson	25
oli414	1
j-conrad	1
paulmelis	1
ghobot	1
johnshaughnessy	1

Code of conduct

- Clearcoat material**  
scerelli started 5 hours ago in Art Questions · Unanswered
- Room code lifetime**  
bemyevent started 14 hours ago in General Questions & Discussion · Unanswered
- Stack up date and rollback failed due to c5.2xLarge server not available on AWS.**  
StudioDeussen started on Nov 15, 2020 in Hubs Cloud Questions · Answered
- Problems with step 2 of CloudFormation**  
Roberto-cpu-spec started 13 days ago in Hubs Cloud Questions · Answered
- My Assets - longevity and storage space**  
minim-sheba started 2 days ago in Spoke Questions · Unanswered
- Can't import avatar recommended asset packs**  
akihiro-shibue started 3 days ago in Hubs Cloud Questions · Unanswered
- "HC is offline" overnight while everything is ok**  
Dayk0 started 3 days ago in Hubs Cloud Questions · Answered

19:29

**Make it easy**



19:40

# Proactive moderation



20:14

**Be part of your community**



21:17





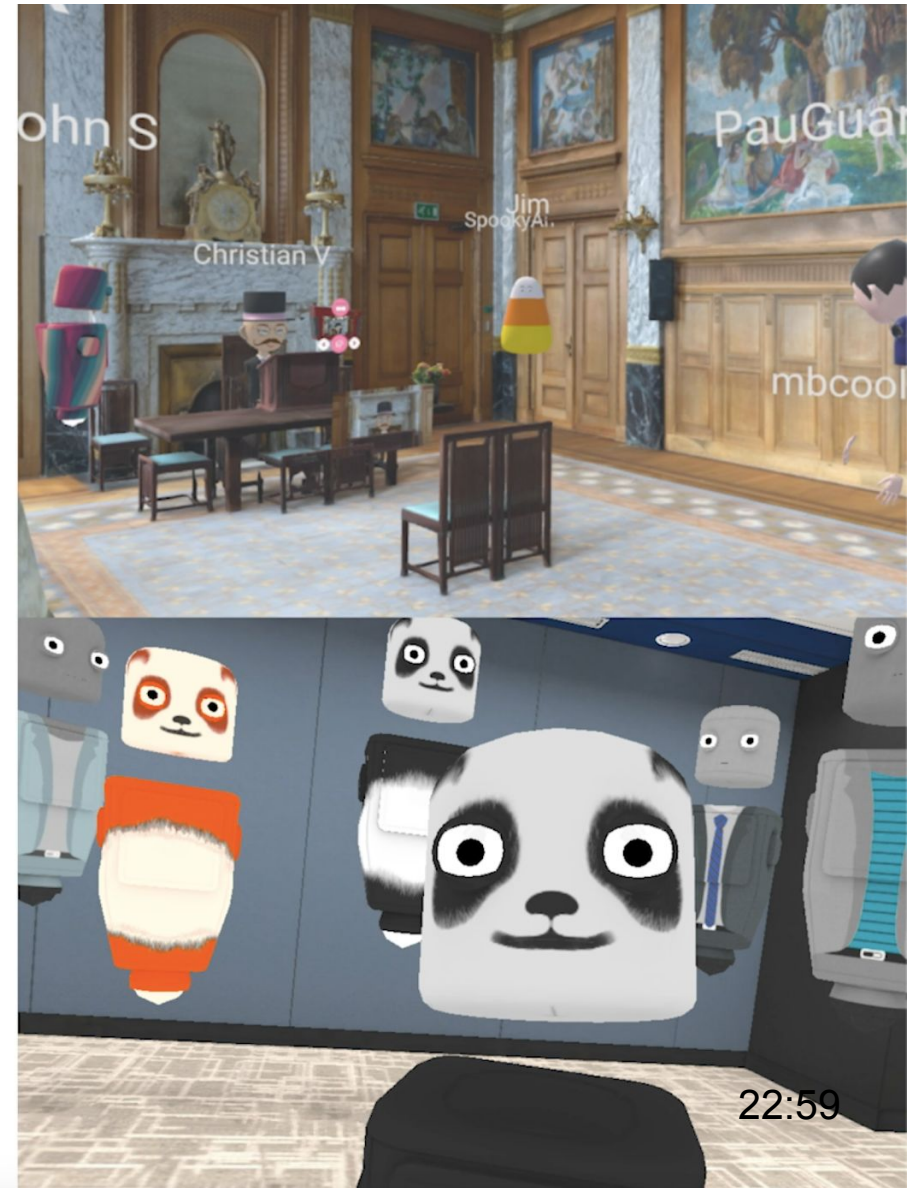
# **Conclusion**

# Mozilla Hubs

Works across devices

Runs in a web browser

No downloads or installation



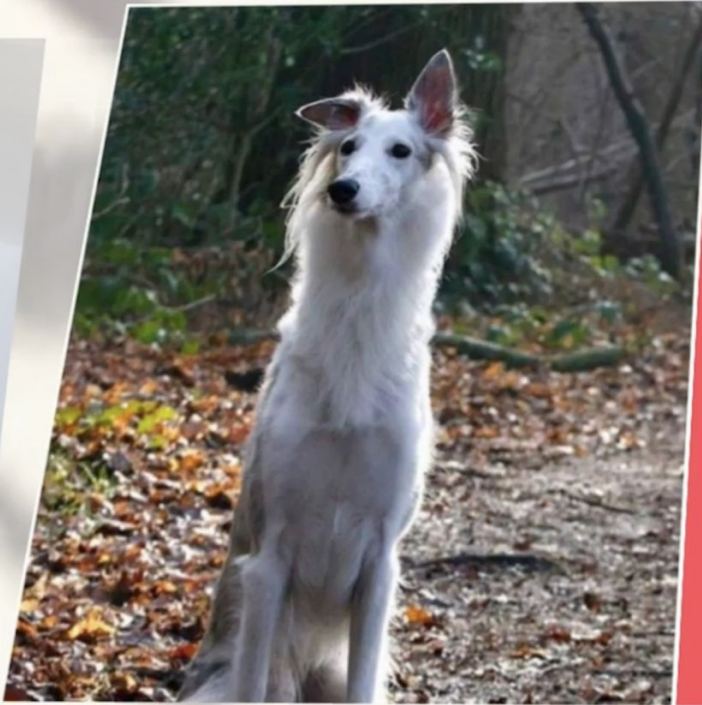
# Community Strategies

Make it easy

Proactive moderation

Be part of your community





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(hond)



**HUBS.MOZILLA.COM**



Share a virtual room with friends.  
Watch videos, play with 3D objects, or  
just hang out.

Create Room



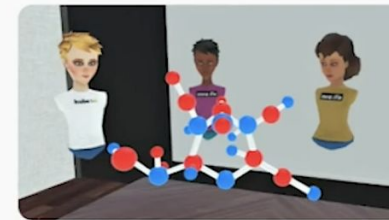
#### Instantly create rooms

Share virtual spaces with your friends, co-workers, and communities. When you create a room with Hubs, you'll have a private virtual meeting space that you can instantly share - no downloads or VR headset necessary.



#### Communicate naturally

Choose an avatar to represent you, put on your headphones, and jump right in. Hubs makes it easy to stay connected with voice and text chat to other people in your private room.



#### An easier way to share media

Share content with others in your room by dragging and dropping photos, videos, PDF files, links, and 3D models into your space.

Say hi 🖐️

[emclaren@mozilla.com](mailto:emclaren@mozilla.com)

Twitter @elginskye

@mozillahubs

