Authoring tools to democratize the authoring of VR experiences

MediaVerse EU Project 2020-2023

Grant agreement no 957252

23 Sept-2021 D. Ververidis

Dr. Informatics, Centre of Research and Technology Hellas



MediaVerse

A universe of media assets and co-creation opportunities



- User driven
- immersive
- accessible

media authoring

for non-experts in programming





90% of XR application are done with:





So what?



I want to make an educational experience, not a game, and I am not a programmer but a teacher / cultural expert!



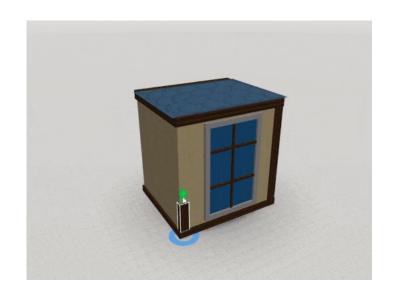
Success stories

• Cospaces + TinkerCad = excellent pathway for learning 3D technologies for children

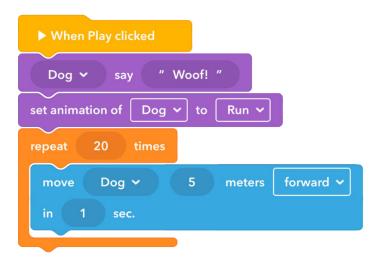




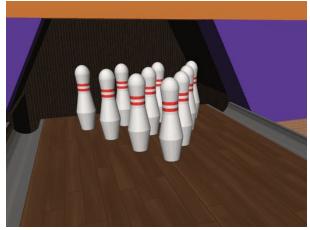
Cospaces: Edit, programming, play







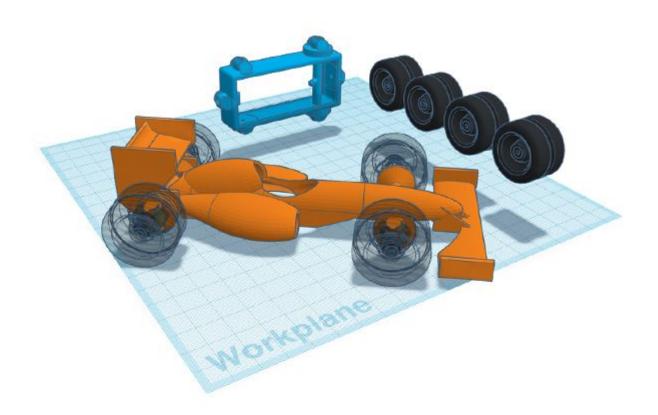
- From Web browser
- Scratch MIT language for programming
- No strong requirements for PC





Tinkercad

- For Web browser
- No strong PC requirements
- No coding
- Simple edits
- Free



Overall



	High Quality Experiences	Easy	Comments
1 Graphic Engines Unity and Unreal		X	 Suitable for programmers C# and C++ coding High-end PCs
2 WebGL editors Cospaces, Tinkercad and others	X		Suitable for schoolsScratch MIT coding)Low - end PCs
3 ????			• ????

Research

Most of the tools for non-programmers are web based and produce a low quality result

- No Shadows
- No Secondary lights
- No animation
- No standalone applications production
- No advanced VR characteristics
- No multiplaying

8	Name	Field	Scope	Features
1	Amazon Sumerian (https://aws.amazon.com/sumerian)	Training, Socializing, Various	Interface to author general purpose 3D environments with avatars	3D editor targeting programmers; AWS speech synthesis and recogni- tion
2	BrioVR (https://briovr.com)	Architecture	Allow the presentation interior design and objects in VR	3D Editor; lighting conditions config- uring; asset uploader
3	Cospaces (https://cospaces.io)	Education	Allow children to author and program 3D experiences	3D editor; visual programming inter- face; class management; VR support
4	Dataverse (https://dataverse.xyz)	Journalism, Culture	Allow journalists to present a story in 3D space	Editor based on google sheets; Multiple layouts of 360 VR scenes based on 5 templates; Open source
5	Experizer (https://experizer.com)	Training, Education	Allow the presentation of information in 3D	3D Editor; Several templates; Quizzes support; Storyline support
6	Fader (https://app.getfader.com/)	Journalism, Real-estate	Author stories and tours through 360 images and videos	3D editor; Media uploader; Tags insertion; scenes interconnection
7	<pre>IKEA Home planner (https://www.ikea.com/ us/en/planners/)</pre>	Architecture, Interior de- sign	Create rooms and insert IKEA furniture in 3D space in order to contextualize them	3D editor; room walls editor; resume asset inventory with prices
8	InstaVR (https://www.instavr.co)	Education, Various	Author environments based on 360 media and 3D models	3D editor; asset upload; wrap output as a standalone html page; tags
9	Learnbrite (https://www2.learnbrite.com)	Education, Conferencing	Allow educators or medical in- structors to author training ap- plications	3D Editor; asset uploader; quiz editor; storyline authoring; support of multiple players
10	Matterport (https://matterport.com)	Real-estate	Create experiences with iPhone as a photogrammetry device	3D Editor to combine captured models and 360 photos into an experience
11	Mozilla Hubs (https://hubs.mozilla.org)	Socializing, Conferencing	Author 3D spaces for social interaction	3D editor; AWS supported; Multi- playing; Google Poly and Sketchfab asset fetching; Open source
12	nunuStudio (https://nunustudio.org)	Gaming	Author 3D games with a low level 3D editor	3D editor; Asset manager; Animation timeline; Open source
13	PlayCanvas (https://playcanvas.com)	Gaming	Author a 3D game without programming skills	3D editor; asset uploader; animation control; scripts editor; multiplaying
14	RoomSketcher (https://roomsketcher.com)	Architecture	Interior design with simple inter- faces and predefined furniture	3D editor; wall editing; first-person view navigation
0.000	SceneVR (https://scene.knightlab.com)	Journalism	Present stories as 360 videos and images	Images upload; add tags. Open source.
16	Uptale (https://www.uptale.io)	Training	Author training scenarios through 360 images and videos	Upload media; insert tags; create quizzes; view learning analytics

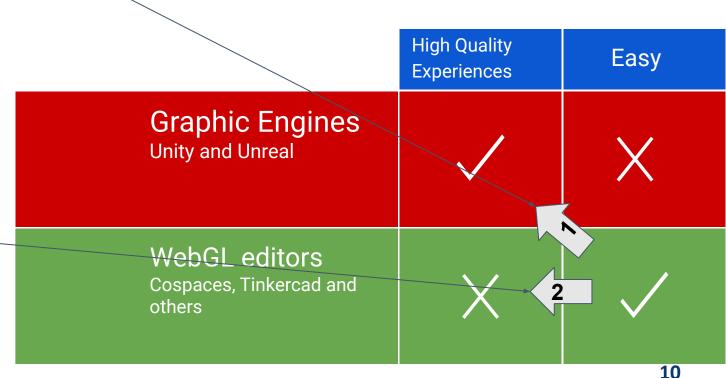
How to improve this situation?



- 1) Make Web editors that can configure Unity projects.
 - Web interfaces
 - **Templates** for basic applications : a) Museum; b) Chemistry Lab; c) Wind-Energy Lab
 - **Unity Server**

2) Make Web format more appealing

- Provide multiplaying capability
- Incorporate Al libraries for fast computing on the educator PC





Work & Examples

- ENVISAGE H2020 project: 2016-2018

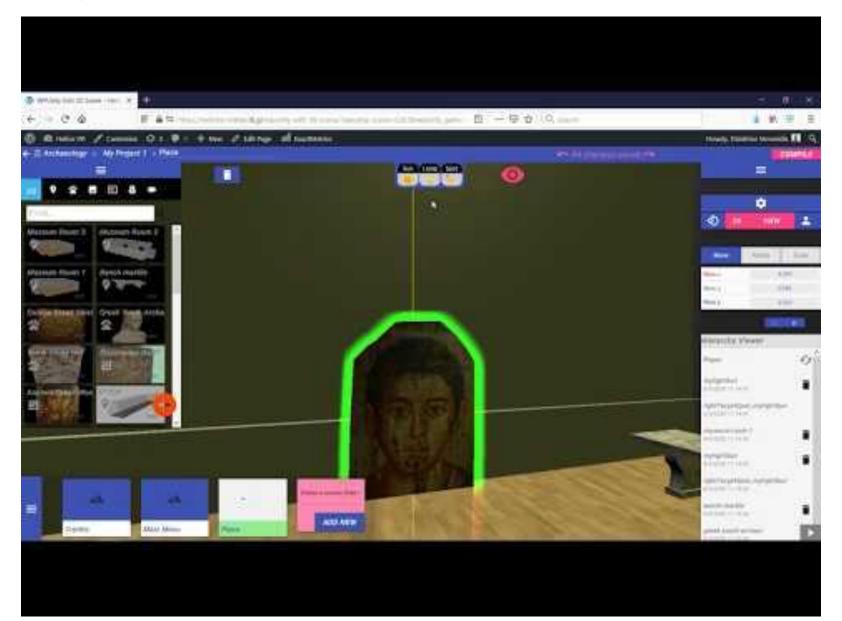
https://www.envisage-h2020.eu/

- DigiArt H2020 project: 2015 2018
 - https://mklab.iti.gr/digiart/
- Helios H2020 project: 2019 2021 (ongoing work)
 - https://heliosvr.mklab.iti.gr

Our Editing interface



Plugin for WordPress sites



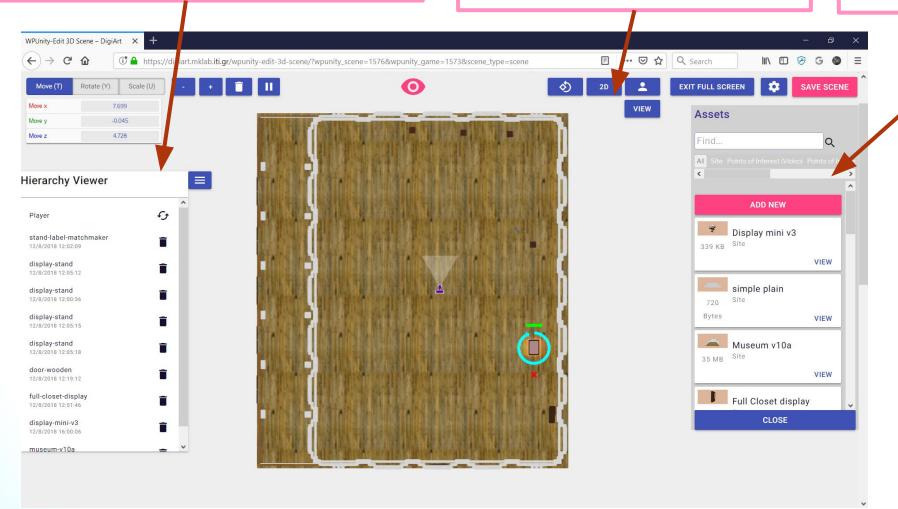
#A1: Improved User friendliness



See all objects inside the scene in a "Hierarchy Viewer

2D View for easy manipulation for novice users

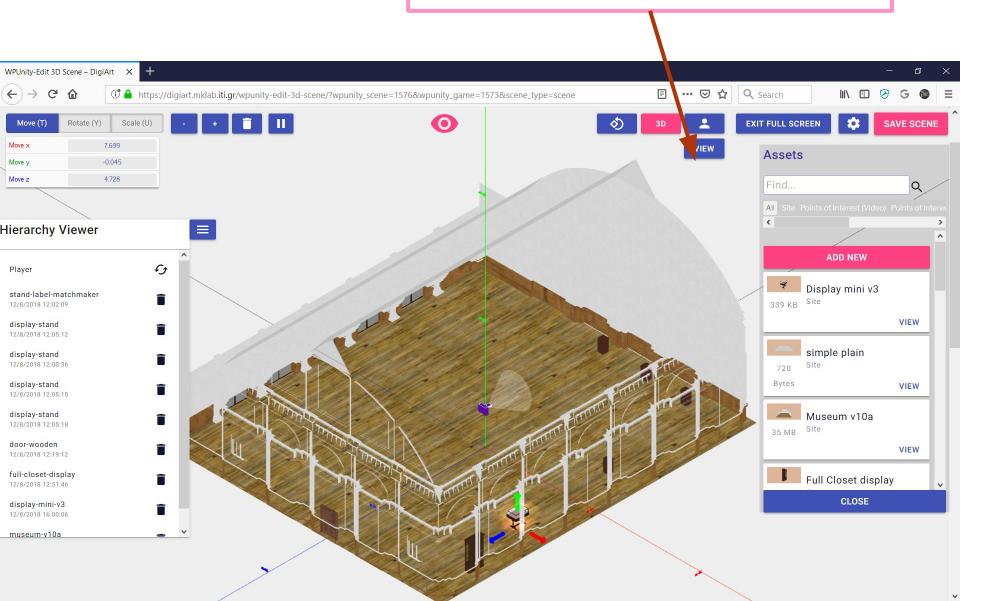
List of available asset and create new asset button



Continue from previous



3D View for "Advanced" users

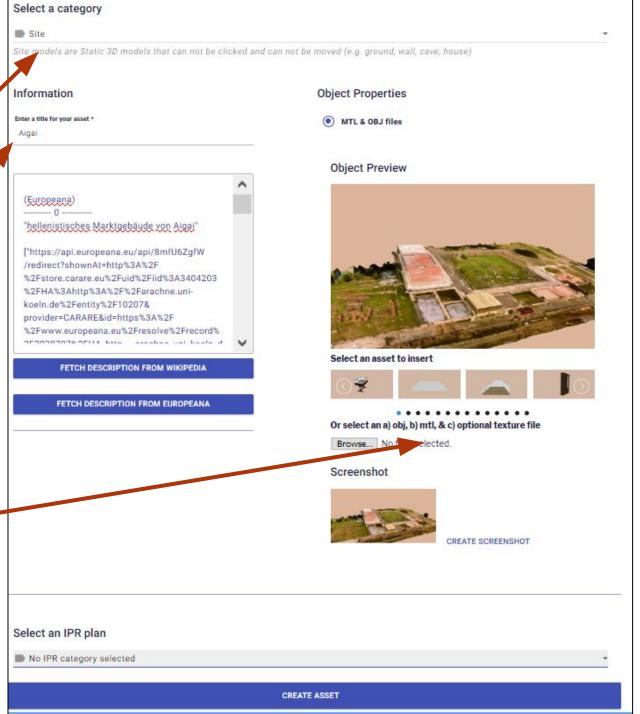


NEW ASSET CREATION

Category of Asset

Name of Asset

Load and Preview 3D model (OBJ, MTL + multiple png or jpg textures)







The Templates

- Wind Energy
- Chemistry
- Archaeology (Museum oriented)
- Theater live (under progress)

Wind Energy Template











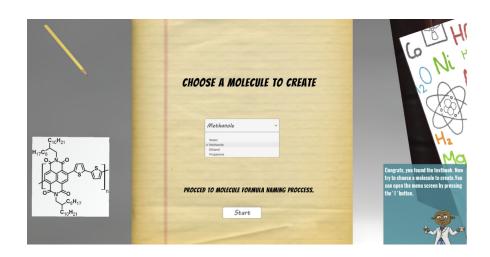


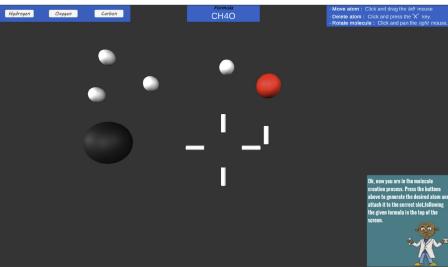
Chemistry Template





Play







Archaeology - Museums

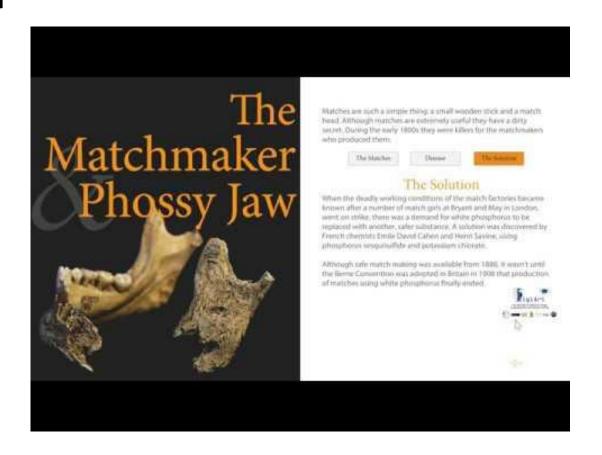




https://mklab.iti.gr/digiart/category/software/

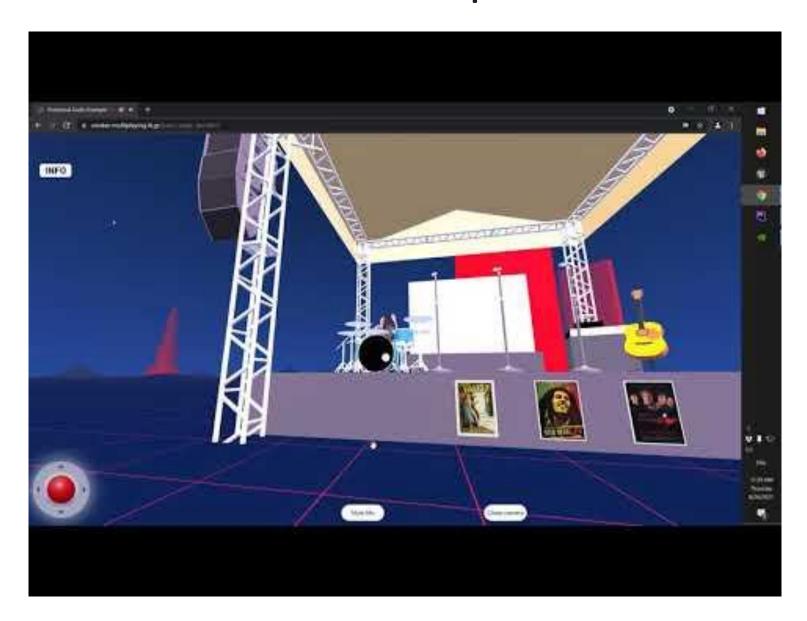
Binaries to download





Theater Template







Theater characteristics

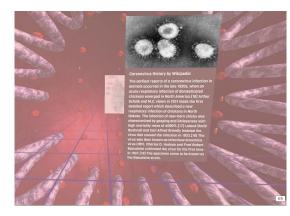
https://vrodos-multiplaying.iti.gr/index2.html

Features

- Web Multi-user (networked-aframe based)
- Audio communication
- GLB, OBJ models
- Billboards with information
- Selfie segmentation with Mediapipe

Device	Head movement	Movement	Interaction
Desktop (Chrome, Firefox)	Mouse: ok	WASD keys: ok	Click with mouse: ok
VR (Firefox Reality in Oculus Quest 2)	Headset: ok	Thumbstick: ok	Laser pointer: ok
Mobile (Chrome)	Device orientation: ok	Virtual Thumbsticks: ok	Touch: ok



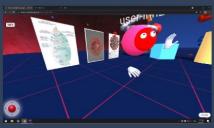




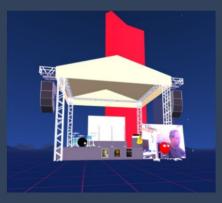
Future plans

- More theatrical scenes
- Democratize access
- Provide as open source
- Evaluate tools
- Teachers are welcomed !!!
- Your feedback is important

MediaVerse Multiplayer VR Sandbox Examples

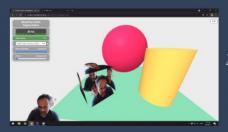


- <u>1. Basic-Audio</u> The first working multiplaying demo. During this demo development, the following functionalities were developed.
- 1. User represented by 3D avatar
- 2. Insertion of 3D models
- 3. Insertion of 3D models as accoustic items
- 4. Support of VR glasses with gestures transfer



2. Basic-Stage

- 1. Same as Basic Audio
- 2. A virtual model of a stage was added
- 3. The user can be represented also with video



3. Plain Aframe with Mediapipe

- 1. Using Local VR
- 2. Adding Selfie-Segmenation example of Mediapipe as texture to a 3D object



More Information

Dimitrios Ververidis, Panagiotis Migkotzidis, Efstathios Nikolaidis, Eleftherios Anastasovitis, Anastasios Papazoglou-Chalikias, Spiros Nikolopoulos and Ioannis Kompatsiaris, "An authoring tool for democratizing the creation of high-quality VR experiences," Springer Virtual Reality, June, 2021, DOI: https://doi.org/10.1007/s10055-021-00541-2

Mouzakis, C., Ververidis, D., Girao, L. M., Patz, N., Nikolopoulos, S., & Kompatsiaris, I. (2021). Holistic Requirements Analysis for Specifying New Systems for 3D Media Production and Promotion. *Sustainability*, *13*(15), 8155. doi:10.3390/su13158155 [pdf]

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https://mklab.iti.gr

Consortium Partners



















TIMELEX



https://mediaverse-project.eu/

MediaVerse: A universe of media assets and co-creation opportunities at your fingertips

