# Web3D 2022 CONFERENCE
## Summary

# The 27th International Conference on 3D Web Technology

https

## Recordings, Tweets and Proceedings

## 2-4 November 2022 - Evry(Paris), France/Worldwide

# Web3D 2022 Conference



**The 27th International Conference On 3D Web Technology** shared innovative and creative ideas on web-based interactive 3D applications.

Works related to various domains, including content creation, 3D printing, fabrication, publishing technologies, web tools, annotation, VR/AR and rendering.

This year's theme was "The Open Metaverse" - Sharing of interactive and interoperable 3D worlds.

Thank you to our presenters and attendees
for participating and sharing your work
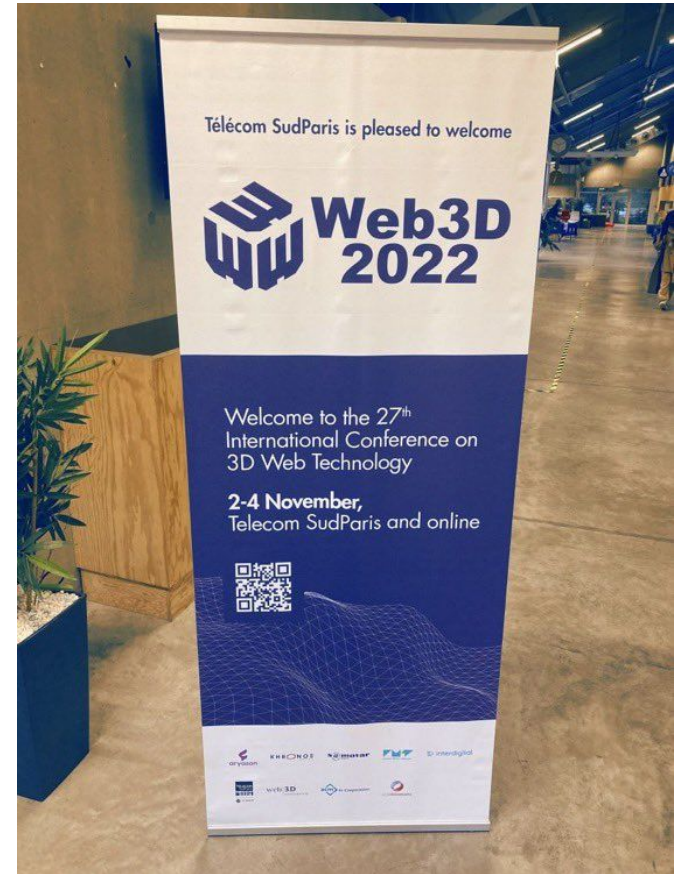
# Our Host



[Telecom SudParis](#)



The Conference was sponsored by [ACM SIGGRAPH](#)
in cooperation with the [Web3D Consortium](#)

# Thank you to our Sponsors

# Committee

**Thank you for your efforts**

## General Chair

**Christophe Mouton**, General Chair, EDF, France

## Program Chairs

**Marius Preda,** Program Chair, Telecom SudParis – Institut Mines-Telecom

I**ndira Thouvenin**, Université de Technologie de Compiègne, France

## Industrial and Business Chair

**Alban Schmutz,** France

## Steering Committee

**Don Brutzman**, Naval Postgraduate, USA
**Anita Havele** (Web3D Consortium, USA
**Nicholas Polys** (Virginia Tech, USA

## Organization Chair

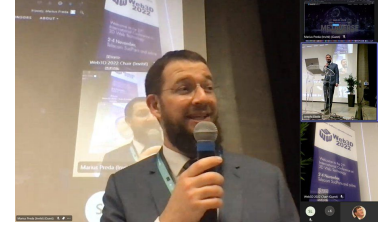**Patrick Horain**, Telecom SudParis – Institut Mines-Telecom

## Web Chair

**Christian Tulvan**, Telecom SudParis – Institut Mines-Telecom
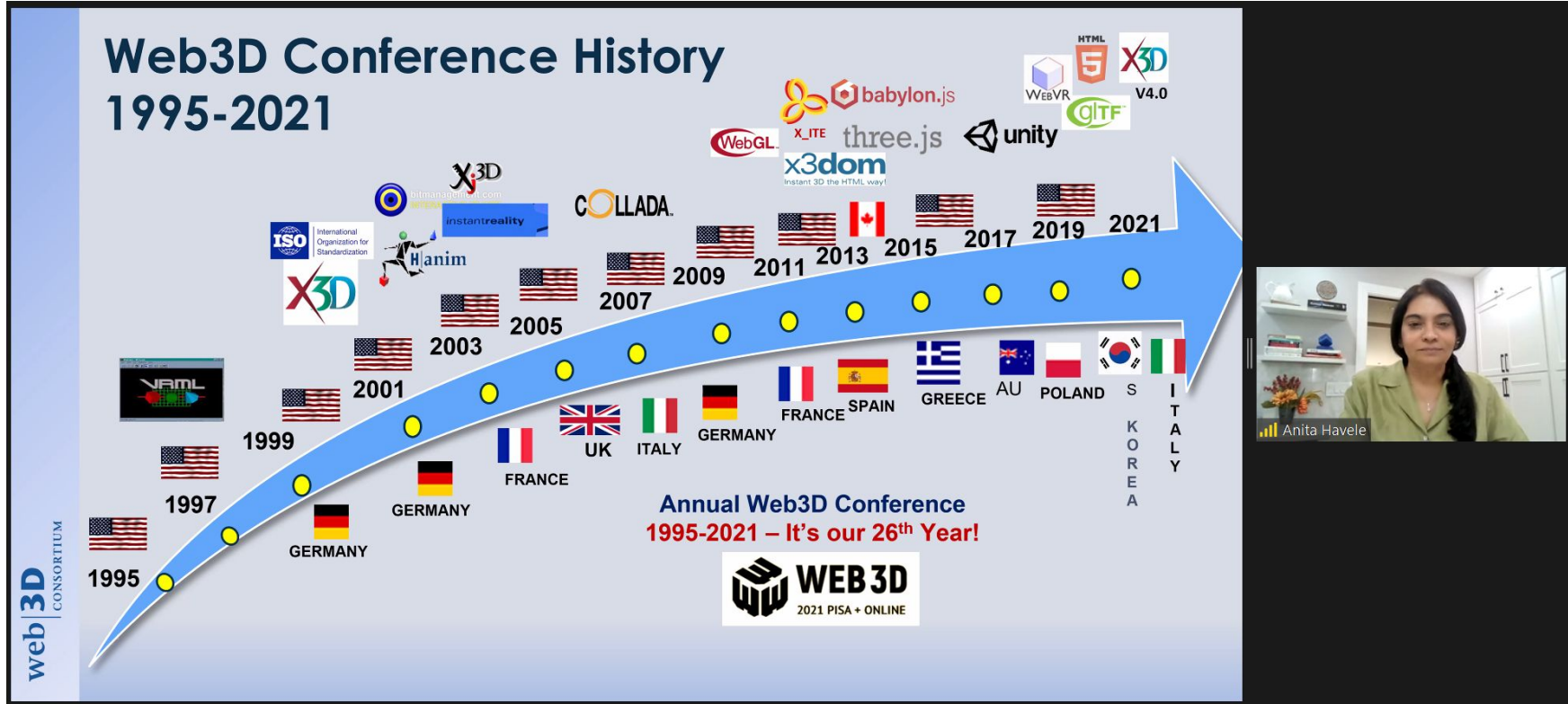
## Media Chair - Audio/Video

**Zied Lahiani**, Telecom SudParis – Institut Mines-Telecom

## Online Platform

**AbhayaDhathri Arige**, Telecom SudParis – Institut Mines-Telecom

# Evolution of Web3D Conferences

# Conference Program

| Time (Paris) | Wednesday, November 2nd | | Thursday, November 3rd | Friday, November 4th |
|---|---|---|---|---|
| 8h30–9h00 | Registration | | | |
| 9h00–9h30 | Welcome Message | | Keynote Speaker – Marc Petit, Epic Games – "Building the Open Metaverse" | Poster Session |
| 9h30–10h00 | Keynote Speaker: Nicholas Polys, President of the Web3D consortium – "What is behind the Metaverse" | | | An Open, Multi-Platform Software Architecture for Online Education in the Metaverse, by S. Lombeyda, S. George Djorgovski, An Tran and Joy Liu (online) • Document Segmentation for WebAR application, by T. Lelong, M. Preda and T. Zaharia • Visual Rehabilitation for Learning Disorders in Virtual Reality, by L. Saunier, M. Panouilleres, C. Fetita and M. Preda. • Spatial Audio Designer, by Nicholas Polys and Noam Bendelac • Deep Learning Classification in web3D model geometries, by C. Tzermia, N. Periklis Chourdas and A. Malamos • Challenges in enhancing Augmented Reality operation with deep learning-based object pose estimation for industrial manufacturing, by H. Durchon, Y. Grall, M. Preda and T. Zaharia |
| 10h00–10h30 | Hardware-accelerated Rendering of Web-based 3D Scatter Plots with Projected Density Fields and Embedded Controls by Lukas Wagner, Daniel Limberger, Willy Scheibel and Jürgen Döllner | | Flexible Photorealistic VR Training System for Electrical Operators by Mikolaj Maik, Pawel Sobocinski, Krzysztof Walczak, Dominik Strugala, Filip Górski and Przemyslaw Zawadzki | |
| 10h30–11h00 | InstantXR: instant XR environment on the Web using hybrid rendering of cloud-based NeRF with 3D assets by Moonsik Park, Byounghyun Yoo, Jee Young Moon and Ji Hyun Seo | | Levels of Representation and Data Infrastructures in Entomo-3D: An applied research approach to addressing metadata curation issues to support preservation and access of 3D data by Wen Nie Ng, Alex Kinnaman and Nathan Hall | Poster-based interactive discussions, demos and discussions on industrial use cases |
| 11h00–11h30 | Terrender: A Web-Based Multi-Resolution Terrain Rendering Framework by Julian Andrea Croci, Alireza Amiraghdam and Renato Pajarola | | Evaluation of simplified 3D CAD data for conveying industrial assembly instructions via Augmented reality by Abhaya Dhathri Arige, Traian Lavric, Marius Preda and Titus Zaharia | (Exhibition Hall) |
| 11h30–12h00 | Framework for Safe Execution of User-Uploaded Algorithms by Toni Tan, Rene Weller and Gabriel Zachmann | | Database for camera-based document images retrieval by Thibault Lelong, Marius Preda and Titus Zaharia | Web3D Consortium Town Hall by Nicholas Polys, Anita Havele and Web3D Consortium Board of Directors |
| 12h00–13h00 | Lunch Break | | Lunch Break | Lunch Break |
| 13h00–13h30 | Golden Sponsor pitch: Aryason, Maher Bethaj, President | | Workshop: Standards for Metaverse | |
| 13h30–14h00 | Tutorial "The use of deep learning algorithms in geometries" by Chrysoula Tzermia and Athanasios Malamos | Workshop "Environmental and sanitary impacts of the metaverse", Part 1 by Alexis Souchet, Jean-Marie Burkhardt, Peter Hancock | • UMI3D: An Open-source Framework to Build an Open Metaverse by Julien Casarin • Overview of Haptics Standardization by Yeshwant Muthusamy and Philippe Guillotel • MPEG status and roadmap for 3D graphics coding by Marius Preda | Workshop "Made-to-Measure Unit-1 on-Demand Manufacturing of Physical and Digital Apparel", by Monika Januszkiewicz, Carol McDonald and Sydney Otten |
| 14h00–14h30 | | | | |
| 14h30–15h00 | | | Panel Session: Manifesting an Open, Interoperable Metaverse with Ralf Schaefer, Leonardo Chiariglione, Yu Yuan, Ingo Simonis, Nicholas Polys, Chris Lane Moderated by Marius Preda | Industrial Use Case Session |
| 15h00–15h30 | | | | Digital Twin for Autonomous Earthwork in VR, by N. Hoffmann, L. Saunier, S. Prouten, O. Serroukh, J-C Le Floch, M. Preda, C. Fetita and T. Zaharia • 3D Connectivity for Digital Twins, by C. Stein and J. Behr • AR for Manual Assembly in Industry, by E. Bricard and T. Lavric • Turn BIM Models in high-resolution architectural images with a web-based real-time simulation and collaboration platform developed with Autodesk Forge and V-Ray SDK, by M. Lalanne, A. Riedel and F. Riedel • Digital Twin and 3D Web-based Use Cases in Industry, by B. Simões, M. del Puy Carretero, J. R. Sanchez, C. Toro and J. Posada • Overview of MPEG volumetric applications, by R. Schaefer and C. Guede • Performing arts in the metaverse: how to open doors for artists and their fans, by G. Dussauze, M. Delemazure and C. Tatangelo |
| 15h30–16h00 | Coffee break | | | |
| 16h00–16h30 | Workshop Web3D technologies for the Notre-Dame de Paris by Livio De Luca, Roxane Roussel, Marco Callieri, Anaïs Guillem, Violette Abergel | Workshop "Environmental and sanitary impacts of the metaverse", Part 2 by Alexis Souchet | Coffee Break | |
| 16h30–17h00 | | | The Keys to an Open, Interoperable Metaverse by Anita Havele, Nicholas Polys, William Benman and Don Brutzman | Poster-based interactive discussions, demos and discussions on industrial use cases (coffee as well) (Exhibition Hall) |
| 17h00–17h30 | | | Defining the Metaverse through the lens of academic scholarship, news articles, and social media by Nathan Green and Karen Works | |
| 17h30–18h00 | | | Designing for Social Interactions in a Virtual Art Gallery by Nicholas Polys | H-Anim and 3D Content Contest |
| 18h00–18h30 | Keynote speaker: Prof. Michael Zyda, USC Viterbi School of Engineering, University of Southern California | | Sponsor pitch: Building the foundation of an open metaverse: an update on Khronos, glTF and the Metaverse Standards Forum, Neil Trevett, Khronos Consortium | Awards ceremony |
| 18h30–19h00 | | | Social Event @ Tour Eiffel (bus leaving from Evry) | |

Detail Program

Platform: Whova with Microsoft Teams
Evry, Paris and Online Worldwide

# Keynote Speakers

https://web3d.siggraph.org/#keynote



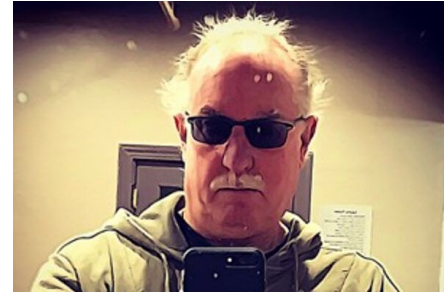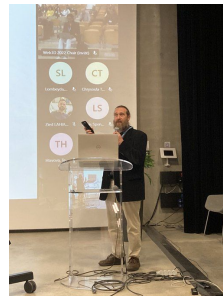**Browsing the Open Metaverse**

Marc Petit – VP, Unreal Engine –  Epic Games

video



**What is behind the Metaverse**

Prof. Nicholas Polys –  President, Web3D Consortium

video, slides



**Let's rename everything the Metaverse**

Prof. Michael Zyda –  Founding Director of USC's Computer Science Games Program

video

# Papers and Posters

Sessions presenting original work in 3D Web research and their applications. Eleven papers and 6 poster subdivided into four thematic sessions.
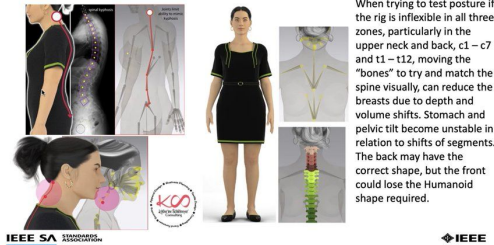
1. **Rendering is key in 3D Graphics**

2. **Metaverse definition and characteristics**

3. **3D Content processing, Augmented and Virtual Reality**

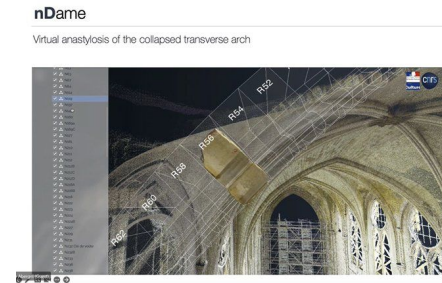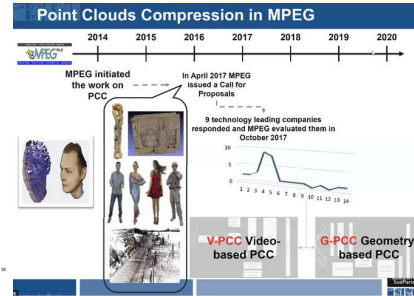4. **Fast forward of Posters presentations**
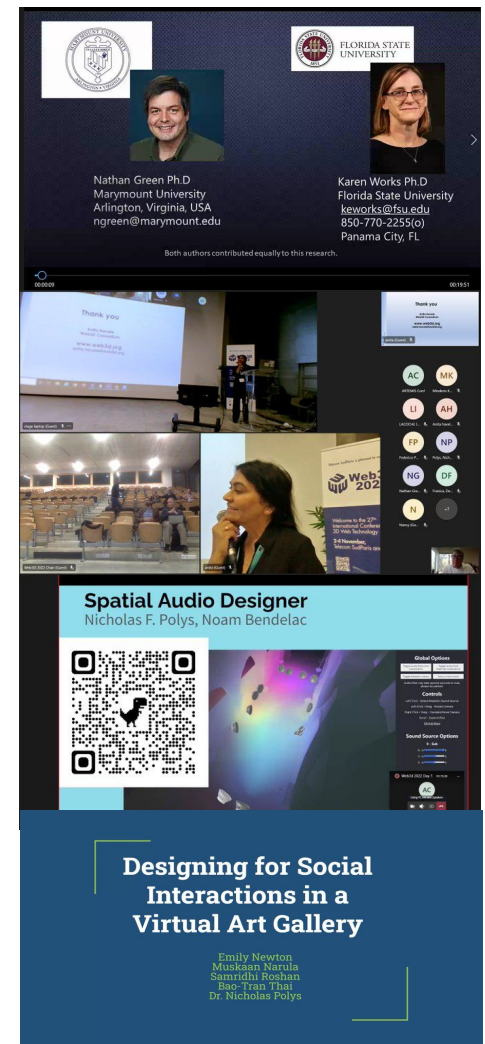
# Workshops

A forum for researchers and practitioners from both the Web and 3D multimedia communities to discuss and exchange positions on current and emergent 3D Web topics.

# Web3D technologies
# for the Notre-Dame de Paris



**The Notre-Dame scientific action currently involves 175 researchers from disciplines such as archaeology, anthropology, architecture, history, chemistry, physics and computer science.**

**Livio De Luca et Violette Abergel (CNRS-MAP): the role of the Digital Data Working Group in the general scientific action, the potential of co-creation, sharing and semantic annotation of 3D resources in multidisciplinary collaborative studies (slides).**

**Roxane Roussel (CNRS-MAP): an approach to build a complete digital report of the cathedral (after fire) with the AIOLI 3D annotation platform.**

**Marco Callieri (CNR-ISTI): the 3DHOP-based visualization and analysis application to interact with specific artifacts (the rib stones), (slides).**

**Anais Guillem (LRMH): a collaborative work on the digital-physical anastylosis of the nave arch (video, slides).**

**Violette Abergel (CNRS-MAP): multimodal exploration of semantically-enriched data (video, slides).**

# Environmental and sanitary impacts of the metaverse



**This workshop aims at presenting the state-of-the-art French and American scientific communities' ways to consider induces side effects of the metaverse**

The French Agency for Food, Environmental and Occupational Health & Safety (ANSES) published an expertise report on Augmented and Virtual Reality's sanitary effects. Jean-Marie Burkhardt (<u>video</u>), who supervised the report, will present the conclusions and his viewpoint on the current status regarding the "metaverse" side effects.

Kay Stanney (<u>video</u>) will present an overview of current research in Cybersickness and how she and her teams at Design interactive are considering such side effects for their industrial work.

Alexis Souchet (<u>video</u>) on "Environmental and sanitary impacts of the metaverse". Digital sustainability by Mark Butcher (<u>video</u>

Representative from the ADEME will present current knowledge on digital's impacts on the environment. Digital sustainability by Mark Butcher (<u>video</u>)

Alexis Souchet will specifically focus on how current knowledge on digital environmental issues can be projected for the metaverse and a roadmap to understand better and tackle the metaverse environmental impacts (<u>video</u>).

**Made-to-Measure Unit-1 on-Demand Manufacturing of Physical and Digital Apparel**
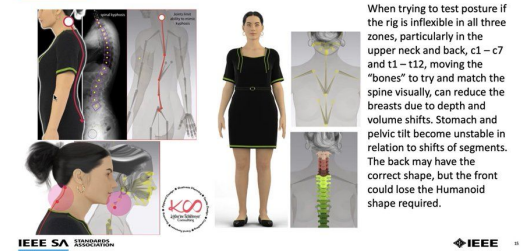


**The aim of the workshop is to develop a conversation between providers of body and material data and the manufacturing consumers of data.**

**The presentation offers a framework for classifying manufacturing stages as independent components connected to the processes and technologies based on the required input and output. To reach this goal, pipeline is designed for the customization of two unisex products: a shirt and a pair of jeans.**

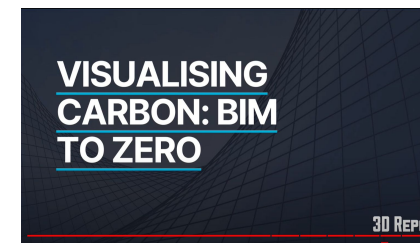**Presented by Monika Januszkiewicz, Carol McDonald and Sydney Otten (in person, video, slides)**
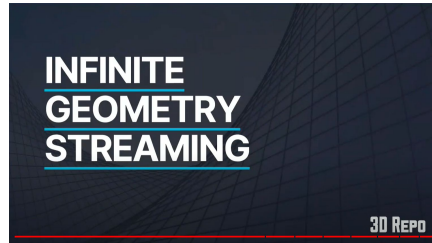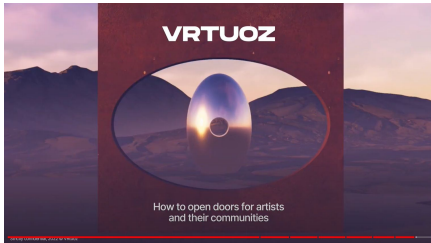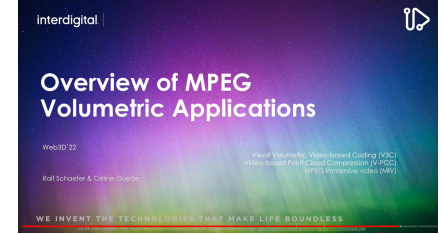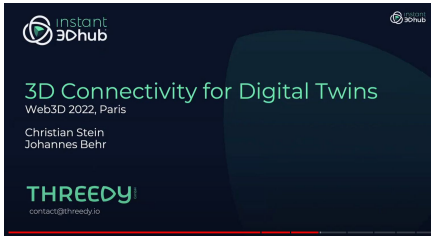
# Industrial Use Cases, 2022: the 10th edition

Industrial use cases enable practitioners to demonstrate how 3D Web technologies may be used in industrial applications and share best practices, and requirements of using 3D in various application domains.

https://web3d.siggraph.org/complete-program/#industrial

Alban SCHMUTZ,
Industrial and business
use cases chair

Digital Twin and 3D Web-based Use Cases in Industry

B. Simões, M. Del Puy Carretero, J. Sanchez, C. Toro, J. Posada

VICOMTECH

Digital Twin for Autonomous Earthwork in Virtual-Reality

Nicolas Hoffmann, Léa Saunier, Samuel Prouten, Oumayma Serroukh, Jean-Charles Le Floch, Marius Preda, Catalin Fetita, Titus Zaharia

Play (k)

3D Connectivity for Digital Twins
Web3D 2022, Paris
Christian Stein
Johannes Behr

THREEDY
contact@threedy.io

AUGMENTED REALITY FOR MANUAL ASSEMBLY IN INDUSTRY

BY EMMANUEL BRICARD AND TRAIAN LAVRIC

Web3D 2022

Turn BIM Models in high-resolution architectural images with
a web-based real-time simulation and collaboration platform

A web application developed with Autodesk Forge and V-Ray SDK

Mathieu Lalanne, DB-Lab CEO   db-lab   WEB TECHNOLOGIES FOR BIM PRODUCTION TRACKING

27th International Conference on 3D Web Technology, November 2022

interdigital

Overview of MPEG Volumetric Applications

Web3D'22

Ralf Schaefer & Céline Guede

Visual Volumetric Video-based Coding (V3C)
Video-based Point Cloud Compression (V-PCC)
MPEG Immersive video (MIV)

WE INVENT THE TECHNOLOGIES THAT MAKE LIFE BOUNDLESS

VRTUOZ

How to open doors for artists
and their communities

INFINITE GEOMETRY STREAMING

3D Repo

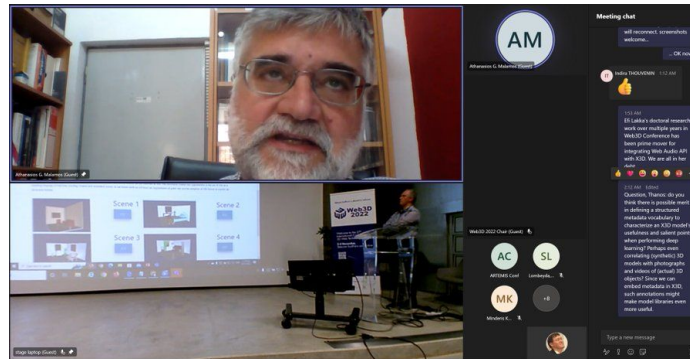VISUALISING CARBON: BIM TO ZERO

3D Repo

From digital twins for
manufacturing
industries, BIM, to Arts
… efficient web3d
everyday tools and
experiences

# Tutorials

[The use of deep learning algorithms in geometries,](#)

by Chrysoula Tzermia and Athanasios Malamos
 (online, video, slides)

# Web3D Consortium Town Hall

Web3D consortium is an open industry consortium creating advanced, royalty-free, standards for 3D graphics. Open discussion session on many activities and roadmap of this nonprofit open standards development organization that provide many opportunities for development of 3D platforms.

by Nicholas Polys, Anita Havele and Web3D Consortium Board of Directors (in person, [video](), slides)
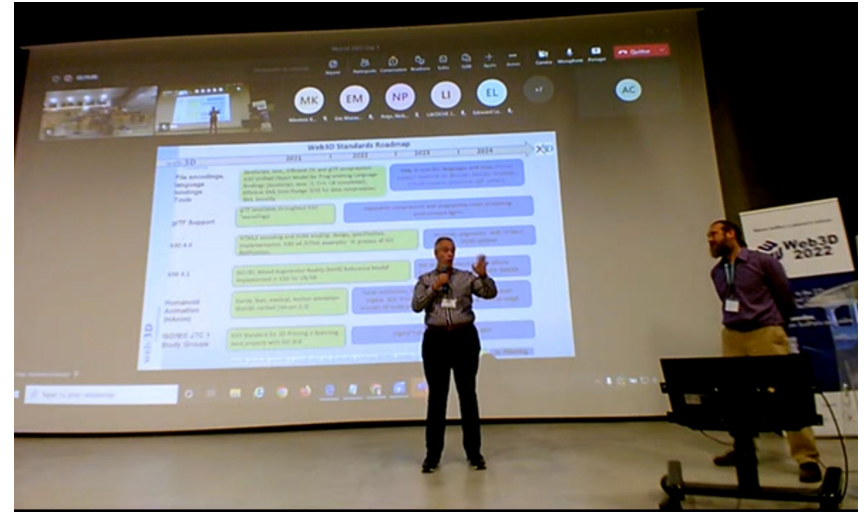
# Panel Session

**Manifesting an Open, Interoperable Metaverse (video)**

## Panelists:

**Prof. Don Brutzman, Naval Postgraduate School**

**Dr. Leonardo Chiariglione, CEDEO, MPAI**

**Chris Lane, 3dMD Ltd**

**Marc Petit, Epic Games**

**Prof. Nicholas Polys, Virginia Tech**

**Ralf Schaefer, Interdigital, MPEG AhG Chair**

**Dr. Ingo Simonis, OGC**

**Dr. Yu Yuan, IEEE SA**

# Best Papers

Congratulations to our winners!!

https://web3d.siggraph.org/awards/

# Posters and Industrial Use Cases Exhibition
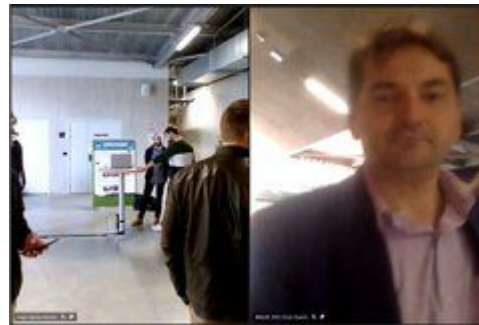
# HAnim Competition Winners







First Prize:

The Snowman's Wish, Yujin JUNG

Second Prize:

Midnight in Gwanganri, Changmin HAN

Third  Prize:

Break Prejudice, Eung-Gyu LEE

Thank you very much!
See you at next year's competition!

Contact HAnim WG @ Web3D!
HAnim WG Co-Chairs:
Myeong Won Lee and William Glascoe

# Dinner Reception at the Eiffel Tower









Madame Brasserie
https://www.restaurants-toureiffel.com/fr/madame-brasserie.html

# **Web3D 2023**
# San Sebastian, Spain
# 9-11 October 2023
# See you there!

Join the Web3D community

Conference Hosting and Participation

Email: plan2023@web3d.org