

Metaverses 101

Decades of History.... What have we learned?

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SIGGRAPH Web3D Metaverse BOF 2022

Shared Virtual Environments

Common Elements:

- Realtime 3D scene in clients with lighting, animation, objects, interaction
 - Load assets into scenegraph
 - Add input devices and output displays
- Scene updates on user interactions (proximity of entities and events, protocols for messaging of events over the network)
- Distribution of changes to all connected clients with minimal latency
- Often text chat and telephony on parallel channels

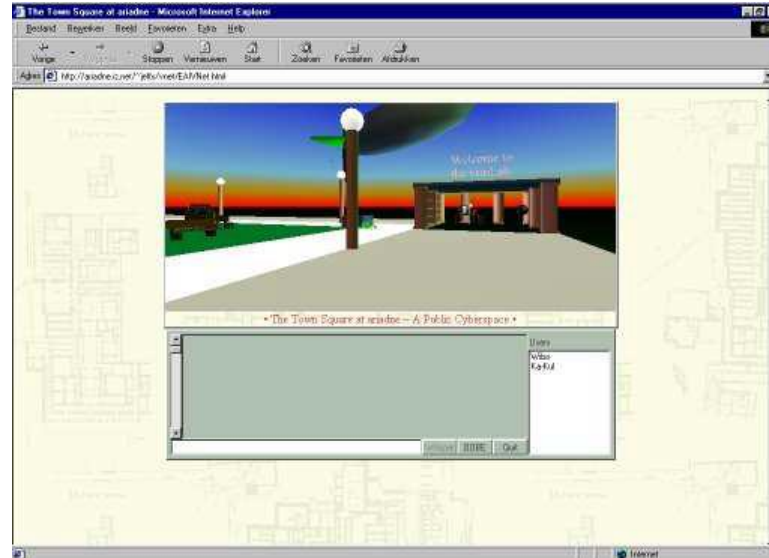
[Web3D's Metaverse Position Paper is online and available HERE!!](#)

Multi-User Worlds - late 1990s

In 1998 I picked a handsome avatar and went to the Arc de Triumph in an interactive 3D world, chatting, flying and gesturing with people from around the world

... all over a 28.8 modem!

- blaxxun (now bitmanagement)
- Canal+
- VNet
- DeepMatrix v1
- Sony



Economies and Politics

- Colony City
- Cybertown
early 2000s



VRML

VIRTUAL REALITY MODELING LANGUAGE



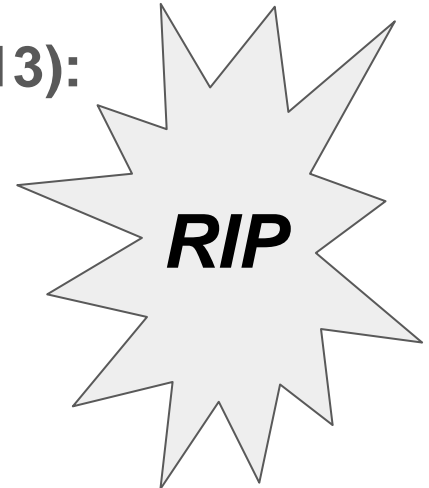
Mid 2000s

- Bitmanagement
- Second Life
- There
- Google Lively



Federal Consortium of Virtual Worlds (2009-2013):

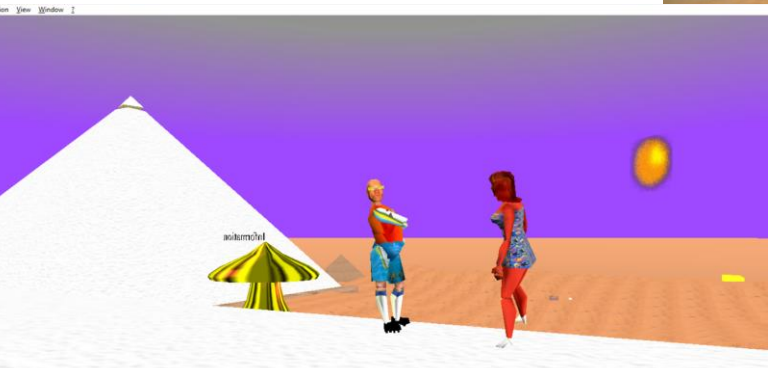
- Avaya
- Teleplace
- VastPark
- Olive



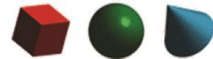
VirtuWorlds Giza (1998-2022)

*Early searches into Web3D
and Virtual Reality:*

- WWW
- GIS
- HANIM
- Multimedia
- Archival 3D

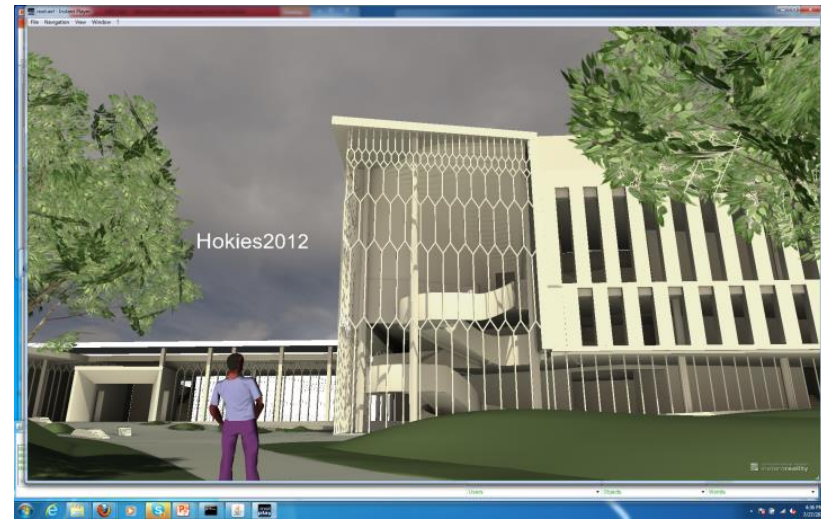


VRML
VIRTUAL REALITY MODELING LANGUAGE



X3D Blacksburg

(2010 -



In 2010/2011:



DeepMatrix v2

Same X3D world; different client and server



**BitManagement
Server**

Virginia Tech HCI Capstone Groups (Spring 2022)

- Project-based requirement for CS HCI Seniors
- User-centered design, prototyping, and evaluation
- Mirror World concept with Moss Arts Center and VT's Fusality Server

(node.js):

- Multimedia in the Metaverse
- X3D for lighting and interaction
- GLTF & X3D models
- X3DOM + Javascript
- Private / Proximity chat
- [YouTubeVideo](#)
- [GitHub - SamyCoder/theArtMetaverse](#)



All Still True:

see *Web3D 2011 Tutorial: [Building Networked Virtual Worlds](#)*

More Recent Observations:

- Use of 3D is rising in every vertical market: “Silos of Excellence”
- The strategy toward separation of concerns has been proven: X3D plays well with others in the WWW ecosystem of Standards
- **User experience still lags expectations**
 - Will the Metaverse be just another ad tracking environment?
 - Will they(it) be specialized to tasks (work, personal, ...)? Interoperable?
 - Security and Safety are key factors for consumer adoption:
 - Is my data protected?
 - Can I remove myself at any time?
 - Rules of engagement?

Metaverse-Standards Opportunities

- X3D is an ISO-IEC Standard open format and API working with the W3C Standard WWW Stack
- X3D XML provides authentication and encryption of 3D assets according to W3C Standard; so for example:
 - LOD per viewer permission ...
 - Treat avatar data like Health Data (HL7 FHIR)
- X3D APIs provides programmatic access to the live scene in multiple languages
- Standard Protocols like DIS are proven in military contexts for over 18 years (that I know of :-)

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References

- Nicholas F. Polys, Benjamin Knapp, Matthew Bock, Christina Lidwin, Dane Webster, Nathan Waggoner, and Ivica Bukvic. 2015. **Fusality: an open framework for cross-platform mirror world installations**. In Proceedings of the 20th International Conference on 3D Web Technology (Web3D '15). Association for Computing Machinery, New York, NY, USA, 171–179. <https://doi.org/10.1145/2775292.2775317>