Virginia Tech

SIGGRAPH 2022
Immersive Visualization for Research, Science and Art BOF

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VIRGINIA TECH™

Virginia Tech

Using Web3D Standards (X3D & VRML) everyday to fulfill our Land-Grant mission:

- Interoperability
- Access
- Reproducibility
- Durability

www.vt.edu

https://arc.vt.edu/

Economies and Politics

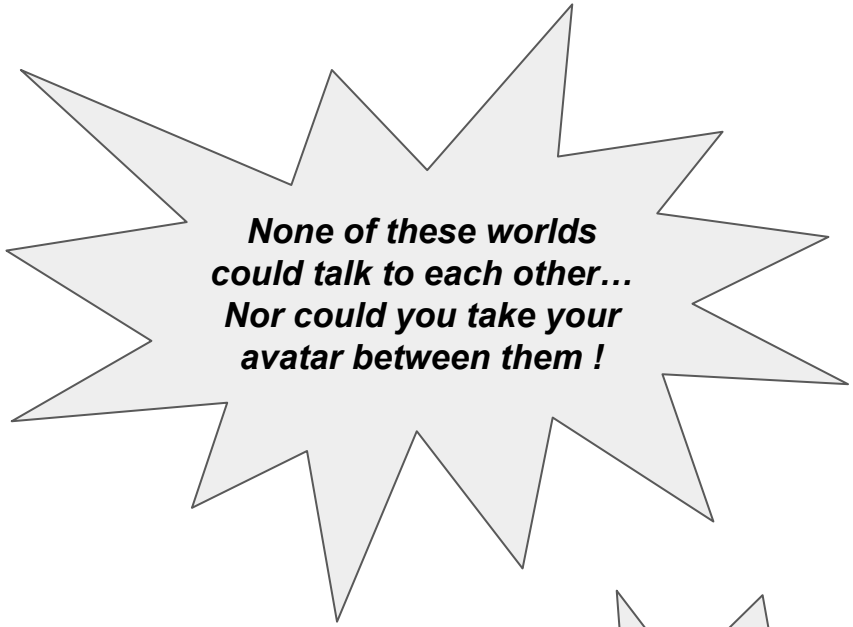
- Colony City
- Cybertown

early 2000s

VRML
VIRTUAL REALITY MODELING LANGUAGE

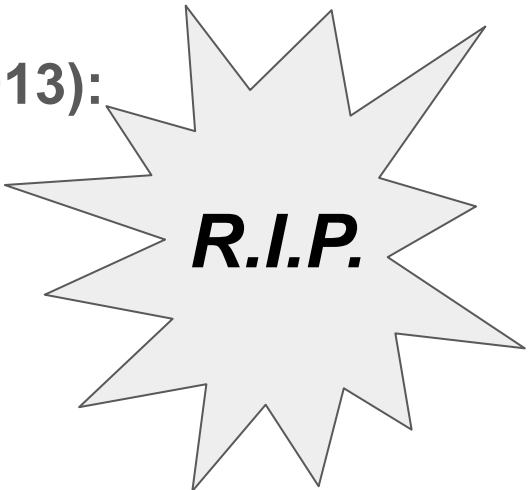
Mid 2000s

- blaxxun
- Second Life
- There
- Google Lively

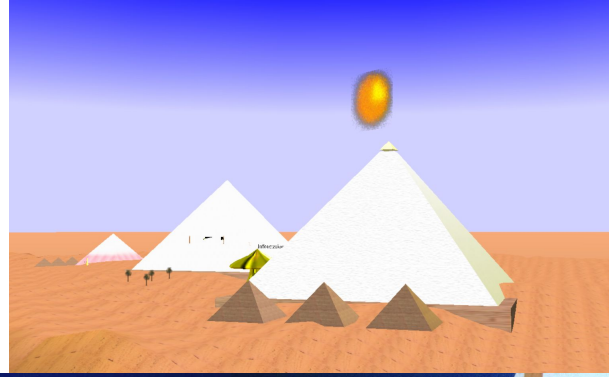


Federal Consortium of Virtual Worlds (2009-2013):

- Avaya
- Teleplace
- VastPark
- Olive

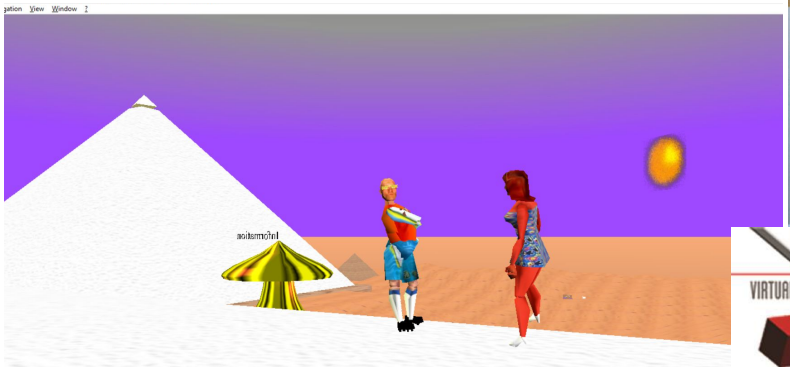


VirtuWorlds Giza (1998-2022)

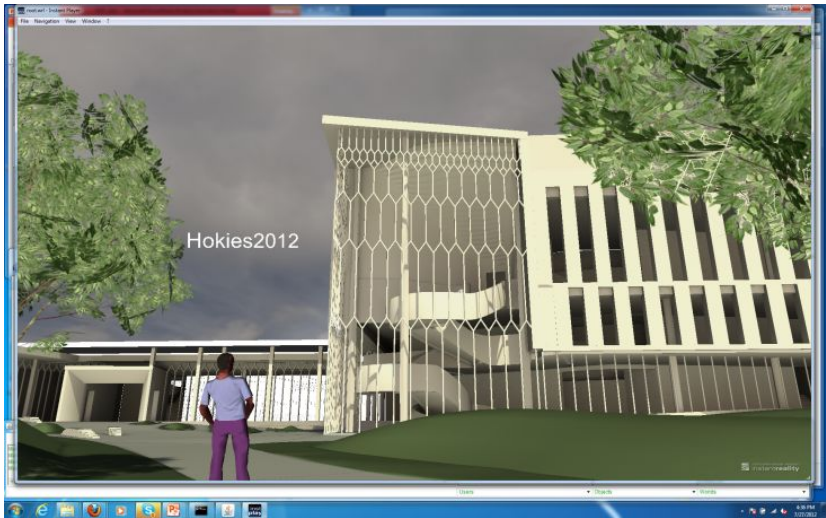


Multimedia Mashup for WWW:

- *Survey drawings + GeoTIFF terrain*
- *Characters, animations*
- *Stands the test of Time*



X3D Blacksburg



In 2010/2011:

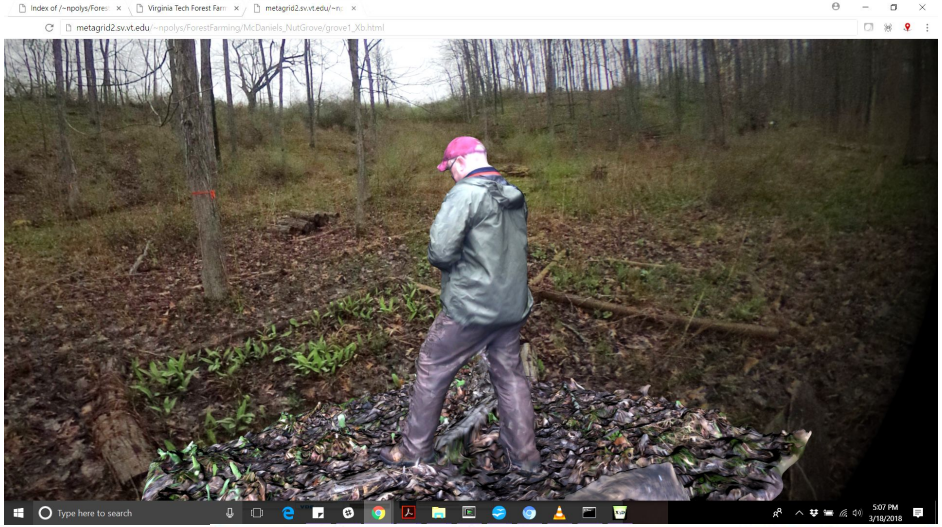
DeepMatrix v2

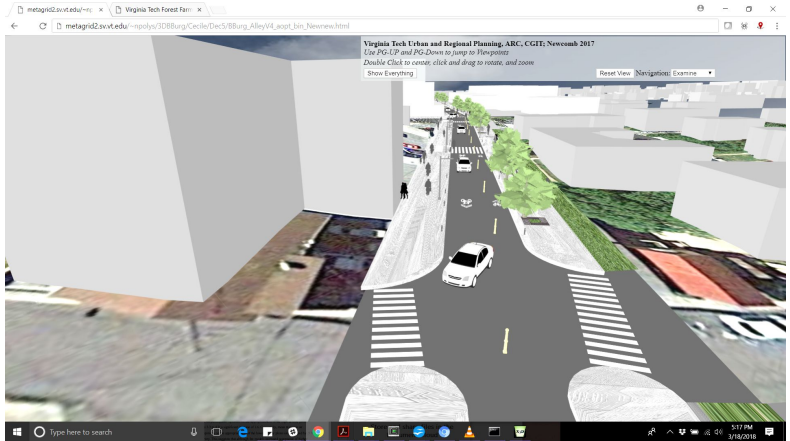
Same X3D world, different client and server

BitManagement Server

Design & Planning

- ***Virtual Tours***
  - 360 video & photospheres
  - Structure.io scans
- ***Town Planning*** (Sketchup + X3D Blacksburg)





Remote Experiences

See also: https://vimeo.com/visionarium2018

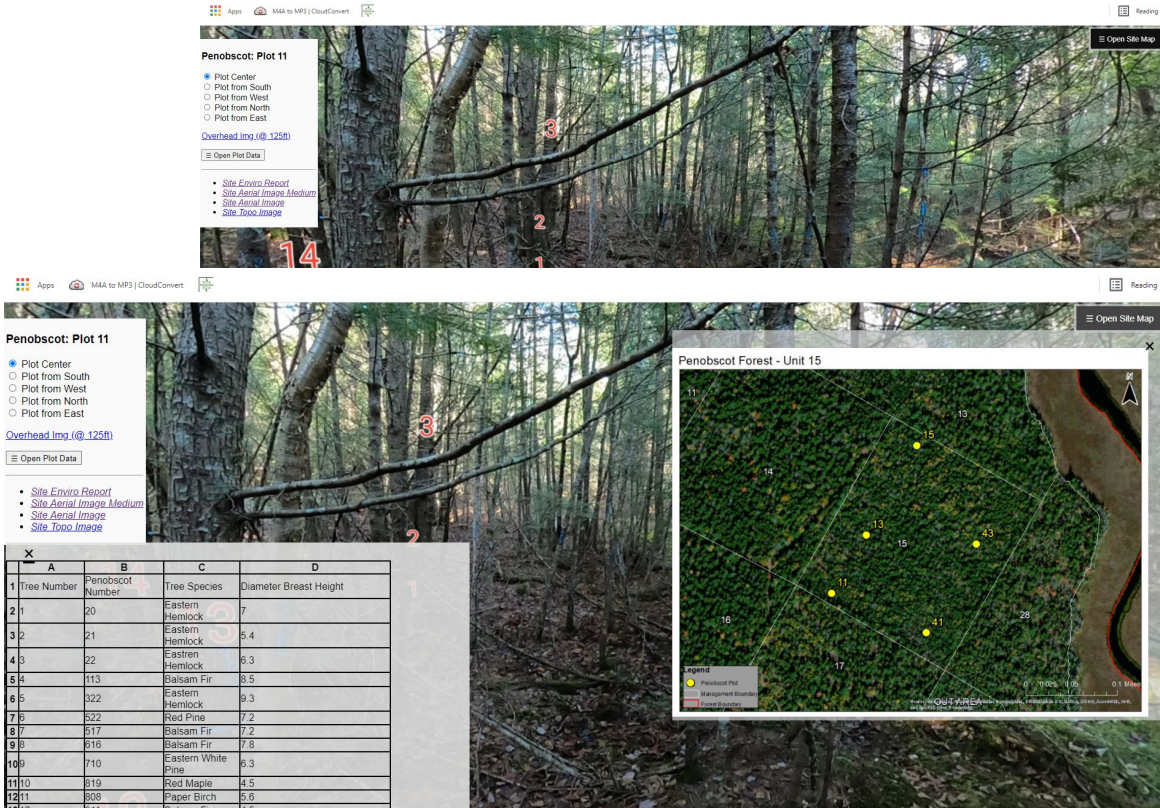
Prof Katie Meaney's

Environmental

Design module

US Forest Service Professional Cert

- Pivoted to online training
- USDA Advanced Silviculture Program is usually a 2 week on-site intensive course
- 6 forests, dozens of plots captured w 360-degree photospheres and drone video spheres



	A	B	C	D
1	Tree Number	Penobscot Number	Tree Species	Diameter Breast Height
2	1	20	Eastern Hemlock	7
3	2	21	Eastern Hemlock	5.4
4	3	22	Eastren Hemlock	6.3
5	4	113	Balsam Fir	8.5
6	5	322	Eastern Hemlock	9.3
7	6	522	Red Pine	7.2
8	7	517	Balsam Fir	7.2
9	8	616	Balsam Fir	7.8
10	9	710	Eastern White Pine	6.3
11	10	819	Red Maple	4.5
12	11	808	Paper Birch	5.6

- VT Forestry News Story: [Immersive and annotated study tour videos filmed using a full-hemispherical camera]
- Presents Overview-and-Detail, spatial properties of site
- *See also:* Web3D 2021 paper on [X3D Field Trips for Remote Learning]

Location-based Graphics

- **HCI Capstone** (Seniors Spring 2022) projects: new explorations into Mirror Worlds
  - Increasing Watershed awareness & stewardship
  - Prototype concepts through user-centered design
- QR codes bridge physical and informational spaces
  - Multimedia
  - Multiplatform (* phone gyro)

Stroubles Creek Projects

Increasing Watershed awareness & stewardship:

- QR codes and map pins to Web addresses
- X3D + HTML5 presentation
- 360 Videos, images
- Links to other resources

https://metagrid2.sv.vt.edu/

metagrid2.sv.vt.edu/~nidhic/Stroubles_Website/index.html

Locations

- Triple Point
- Spout Spring
- Spout Spring (no narration)
- Owens Spring
- Owens Spring (no narration)
- Robinson Spring
- Robinson Spring (no narration)

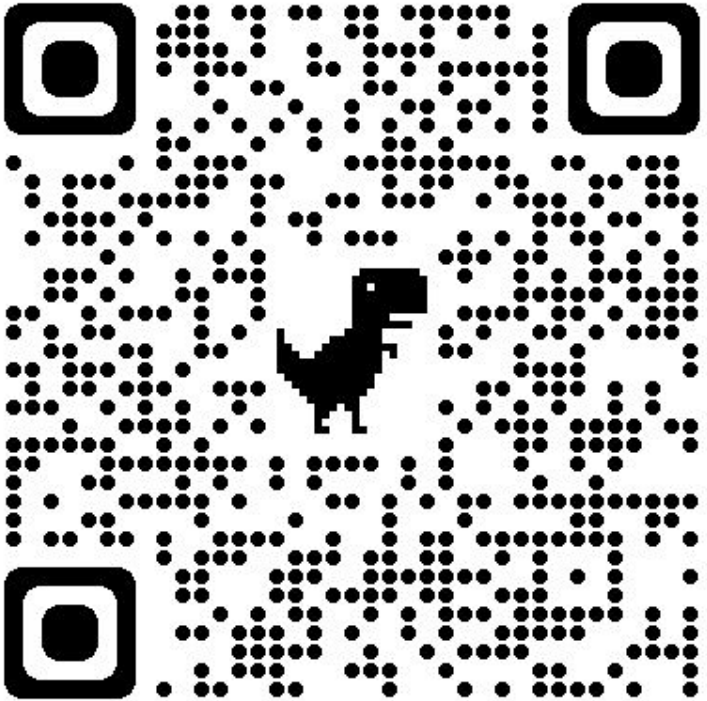
☰ Open Gallery

Useful links: Live

Videosphere Viewing Concept

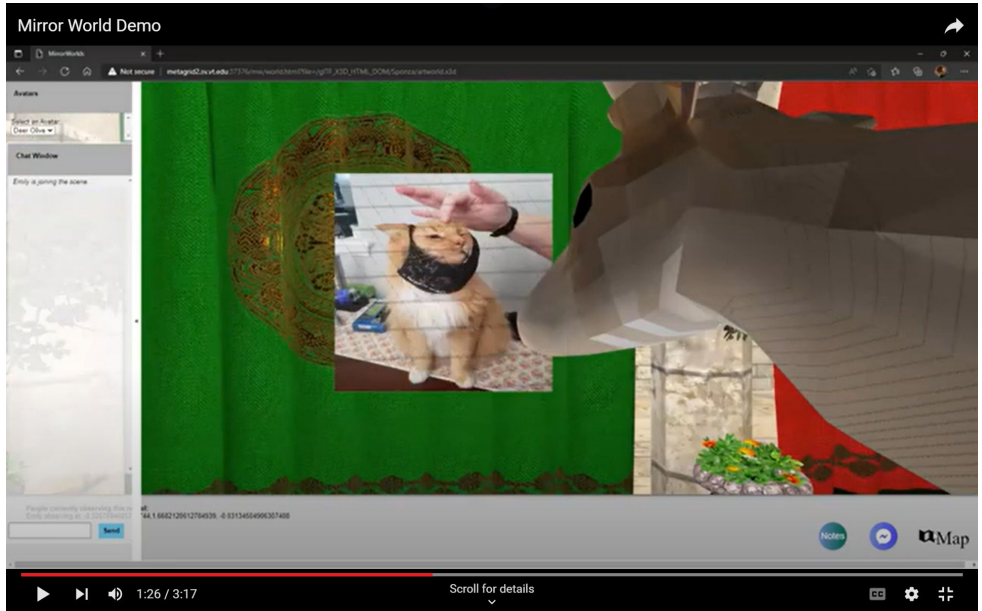
To enable first person view on your phone,

- Click the ‘Start Demo’ link at top right
- Look around in Landscape mode



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?**

Thanks!

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For more on Extensible 3D (X3D) see:

Web3D.org

References

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