

Virginia Tech Visionarium Lab

2017-2018 Immersive Project Highlights

Nicholas F. Polys, PhD

<https://vimeo.com/visionarium2018>



Advanced Research Computing



Immersive Research since the late '90s

- Early NSF-funded University CAVE
- Third generation now with 26.7 million active stereo pixels and ART tracking
- Visionarium Lab is now part of the University Supercomputing group (ARC)
- X3D and VRML are the greatest common denominator for 3D Data across tools, departments, domains
- CAVEs, desktops, mobiles, HMDs and WebVR!

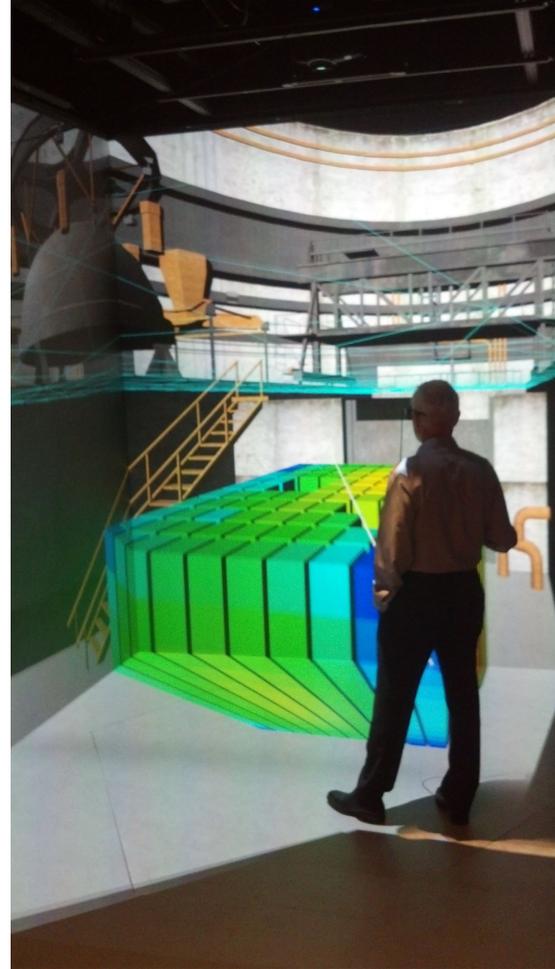
New X3D Projects

Immersive projects (27 m pix stereo CAVE)

- Computational Fluid Dynamics
- WingIT! Installation
- Landscape capture
- Landscape design
- Town planning

HTML5 + WebVR

- Photo and video spheres
- GIS locations



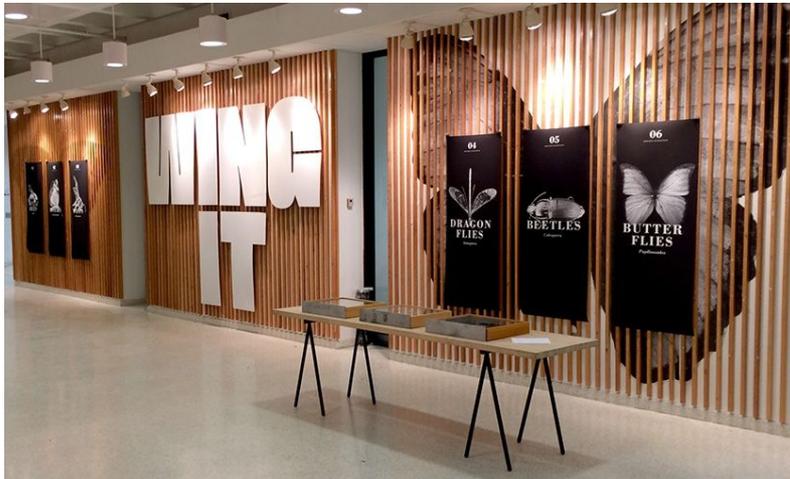
Computational Fluid Dynamics



Here we use immersive VR technologies to analyze the air flow and pressure

WingIT!

- Environmental design class
- Designed installation virtually in CAVE
- Deployed exhibit in Cowgill Hall lobby
- Published design to WWW
- SegD 2018 Design Merit Award winner



Landscape Design

- Graduate class in Forest Farming
- Redesigned 2 locations on campus
- Immersive concept and X3D + VR demonstration



Landscape Capture

- VT Sustainability Center and Stream Lab
- Photospheres
- Drones:
 - Photogrammetry
 - LiDAR
- Point clouds
- GIS & Data fusion



from new crops, multifunctional riparian plantings, silvopstures, and forest farming, to nutrient credit trading and wetland restoration.



The game was shared with the local community; results showed increased environmental awareness of the creek location after players had played the game.

Town Planning

- Master's Thesis on 3D models and immersive visualization in the town planning process
- Used X3D Blacksburg and Sketchup models
- Focus group on perceptions of density
- Published study in *Web3D 2018*



WebVR

With *X3DOM* Javascript library

- Photospheres
- Videospheres
- Volumes
- Heritage
- 3D city models
- ...



More BOFs @ SIGGRAPH 2018

Carto : Mon 12-1:30

Web3D Korea Chapter: Mon 3-5

Design Printing & Scanning : Wed 11-12:30

Web and VR Evolution: Wed 12:30-2

Medical : Wed 2-3:30

Contact

Join the Community at

www.Web3D.org/join

Email :

npolys@vt.edu