

Scaling Up 3D Medical Applications for People Everywhere

Data Harmonization and Web3D

Anita Havele, Nicholas F. Polys,
Chris Lane, Ed Hammond, Vince Marchetti



Advanced Research Computing

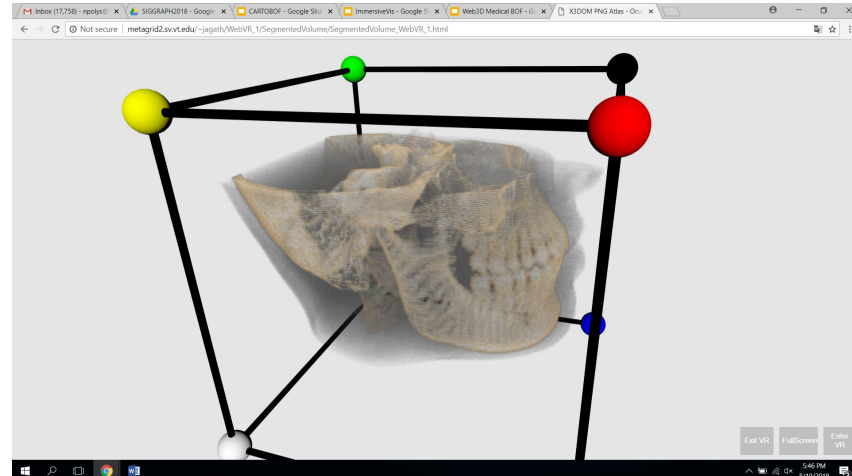


Duke Center for Health Informatics

Wednesday, 2018, August 15 - 5:00pm to 6:30pm

Topics / Discussions

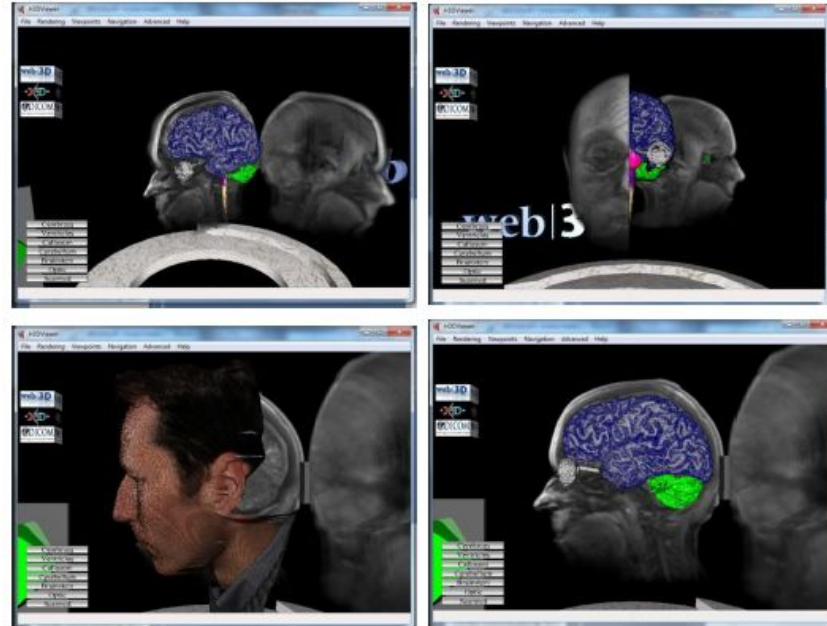
- Web3D & WG introduction
- Access: WWW and VR
- NIH 3D Printing / 3DMD scanning
- HL7 and the Informatics of 3D
- Bioinformatics & Analytics



Web3D.org & WG introductions

Enterprise 3D (X3D): ISO-IEC formats and API:

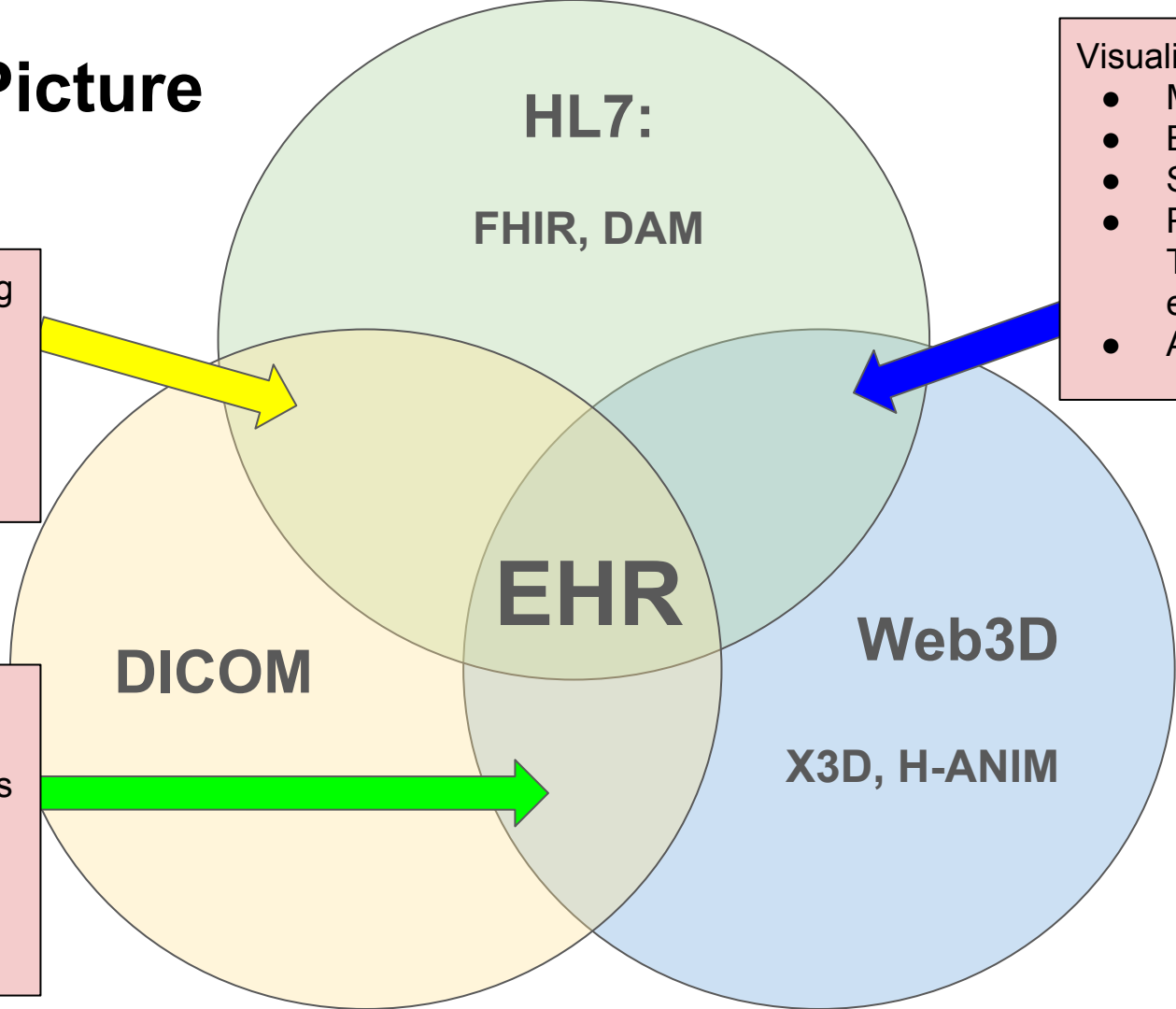
- X3D holds:
 - Volumes, meshes, appearances, metadata
 - Lights, cameras
 - Animation, interaction
- Web3D Medical Working Group
- DICOM Liaison & reciprocal membership
- HL7 Liaison & reciprocal membership



EHR Big Picture

- Patient Imaging
- Treatments
- ...

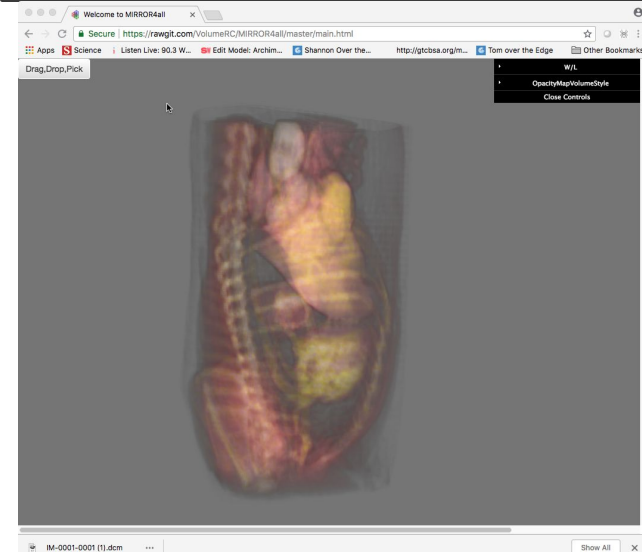
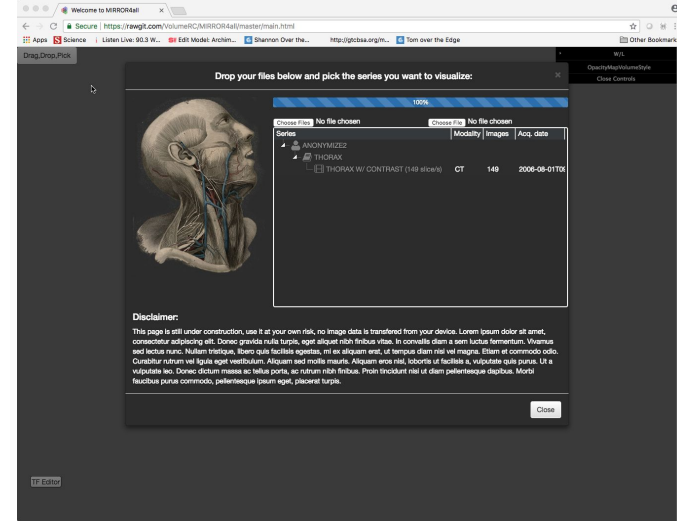
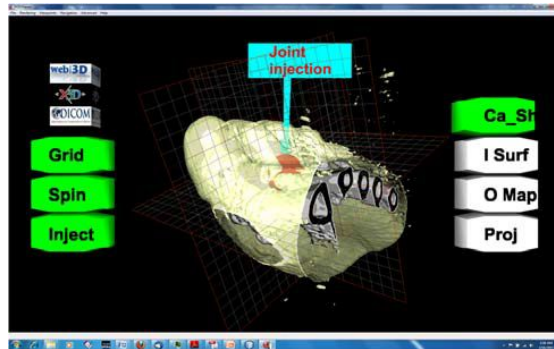
- Volume vis
- Meshes
- Segmentations
- 3D printing



- Visualize:
- Microscopy
 - Bioinformatics
 - Scanning
 - Physical Therapy & ergonomics
 - Analytics

Access: WWW and VR

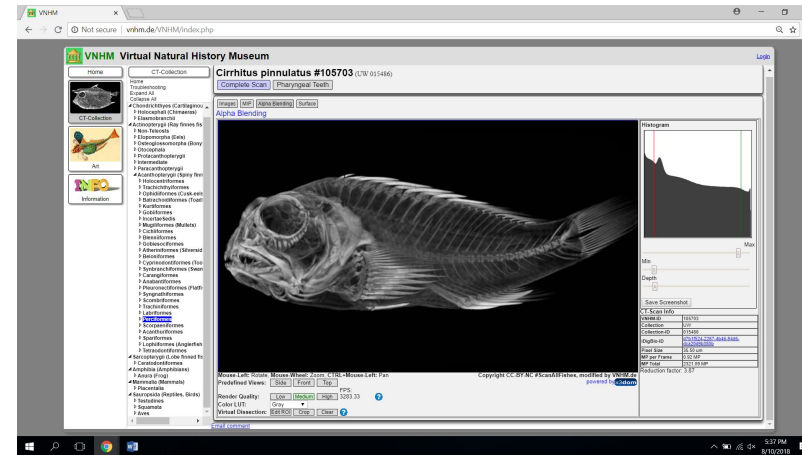
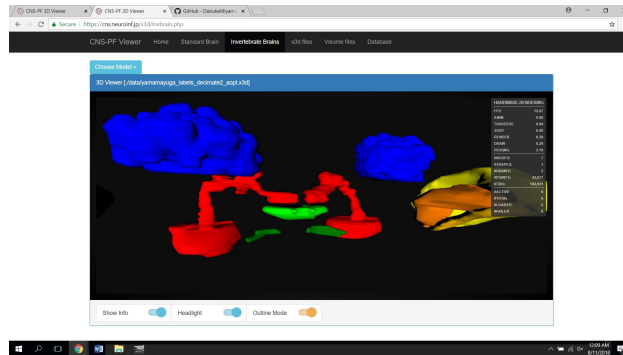
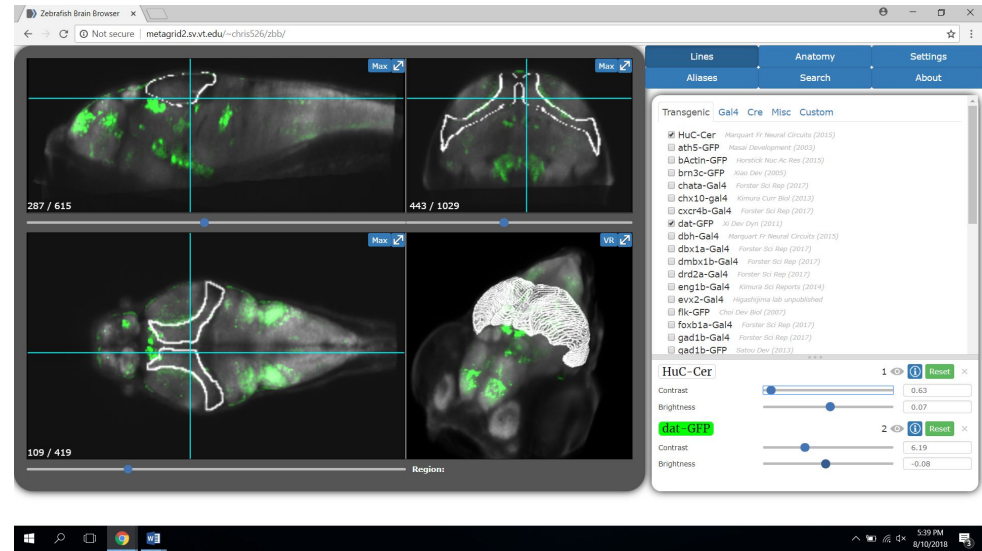
- X3D: desktop, mobile, immersive
- Imaging
 - X3D Volume Rendering
 - TIFF stacks, DICOM, NRRD, PNG
 - Scripted automated conversions
 - Online drag-and-drop service :
 - HTML5/WebGL/X3DOM
 - [Mirror4All](#) by KShell



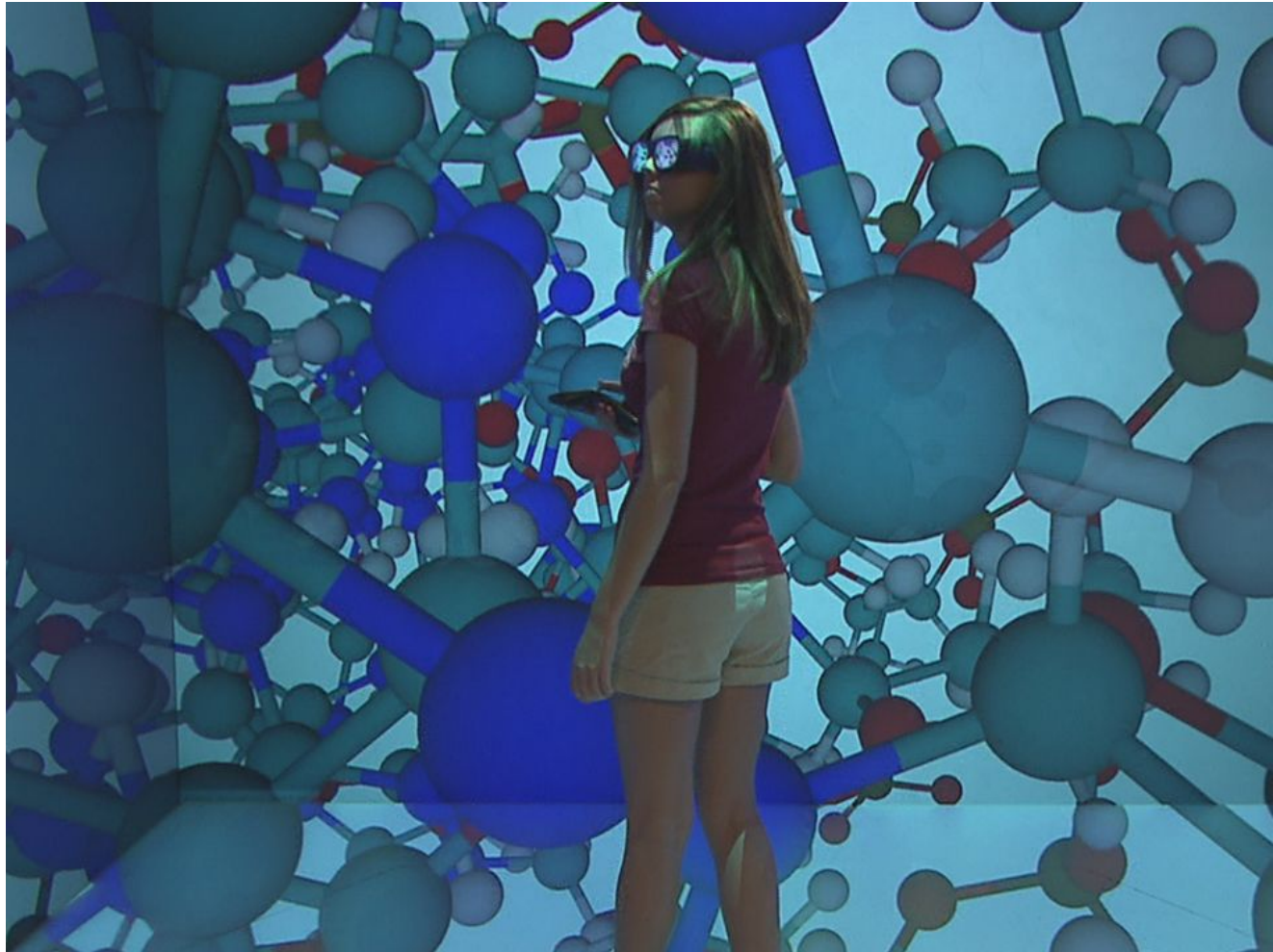
Access: WWW and VR

- Portals

- *Zebrafish genetic and neuro atlas:* zbbrowser.com
- *Virtual Natural History Museum:* <http://vnhm.de>
- CNS-PF [neuron viewer](#)
- Cell image library



VT Visionarium



*27 mil
stereo
pixels !*



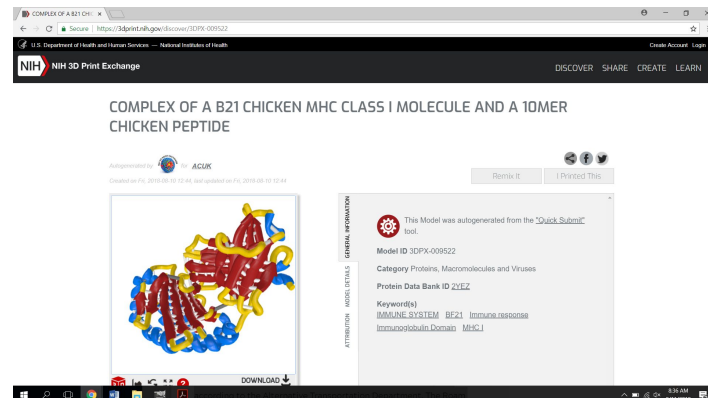
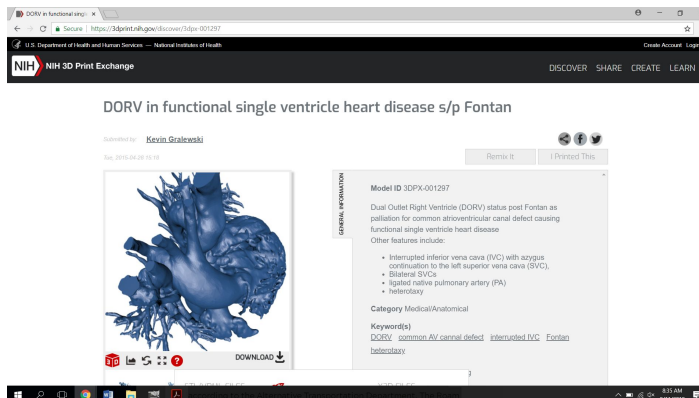
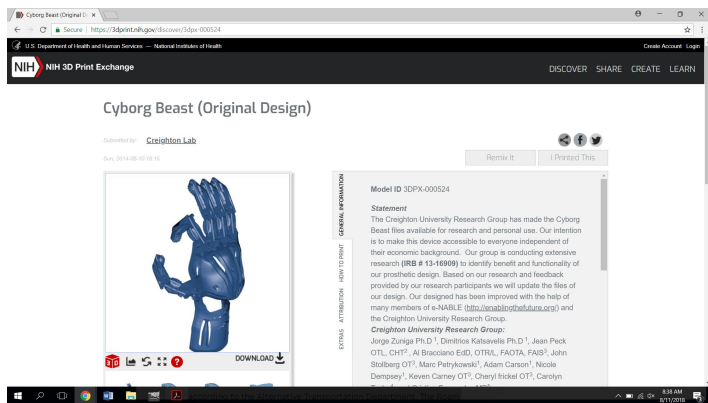
WebVR

With X3DOM Javascript library

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

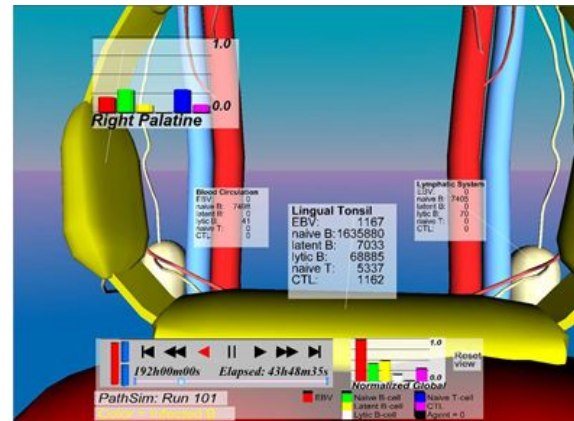
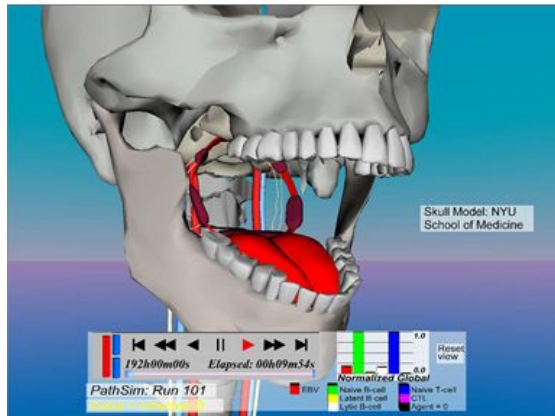


NIH 3D Printing / 3DMD scanning

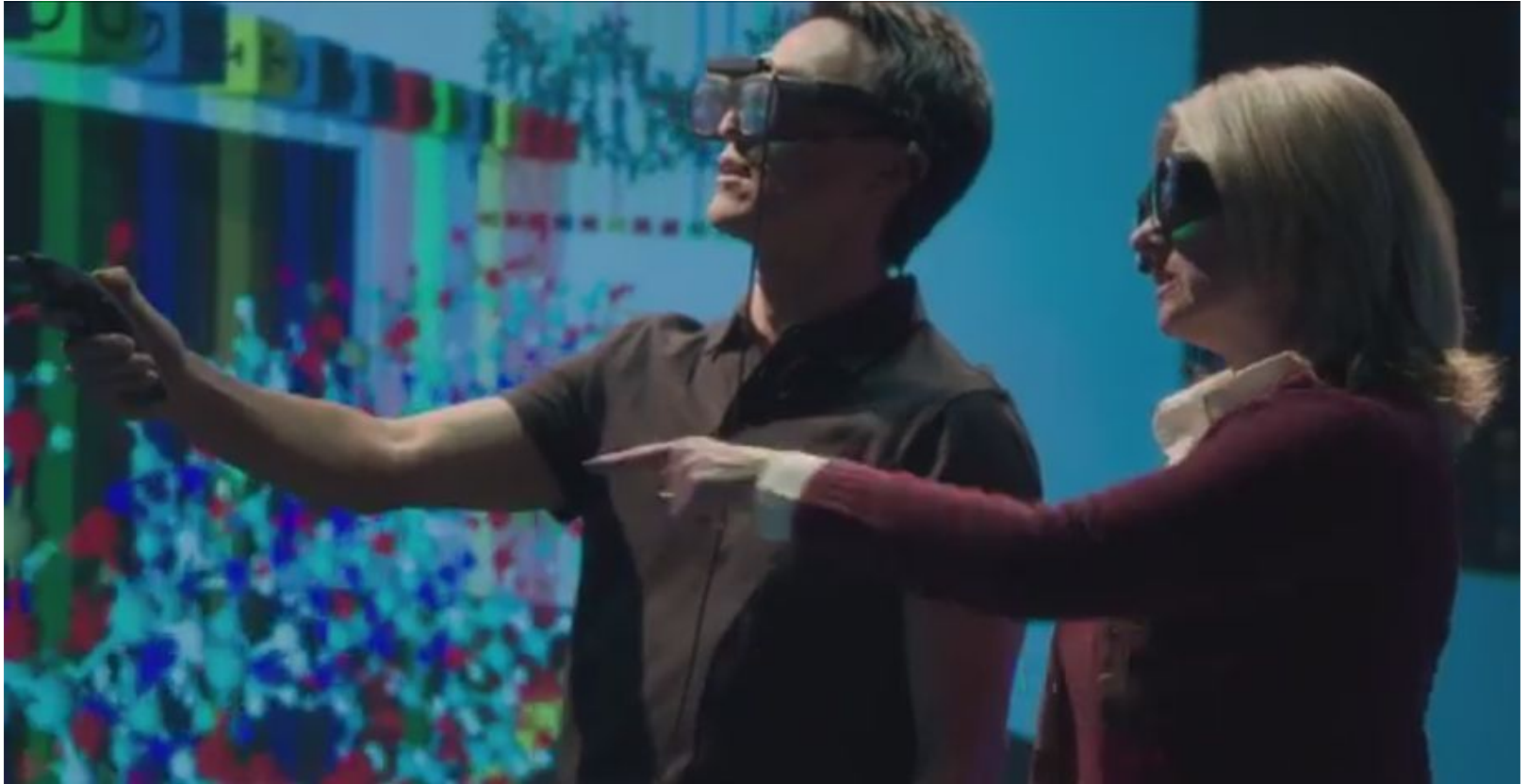


Bioinformatics & Analytics

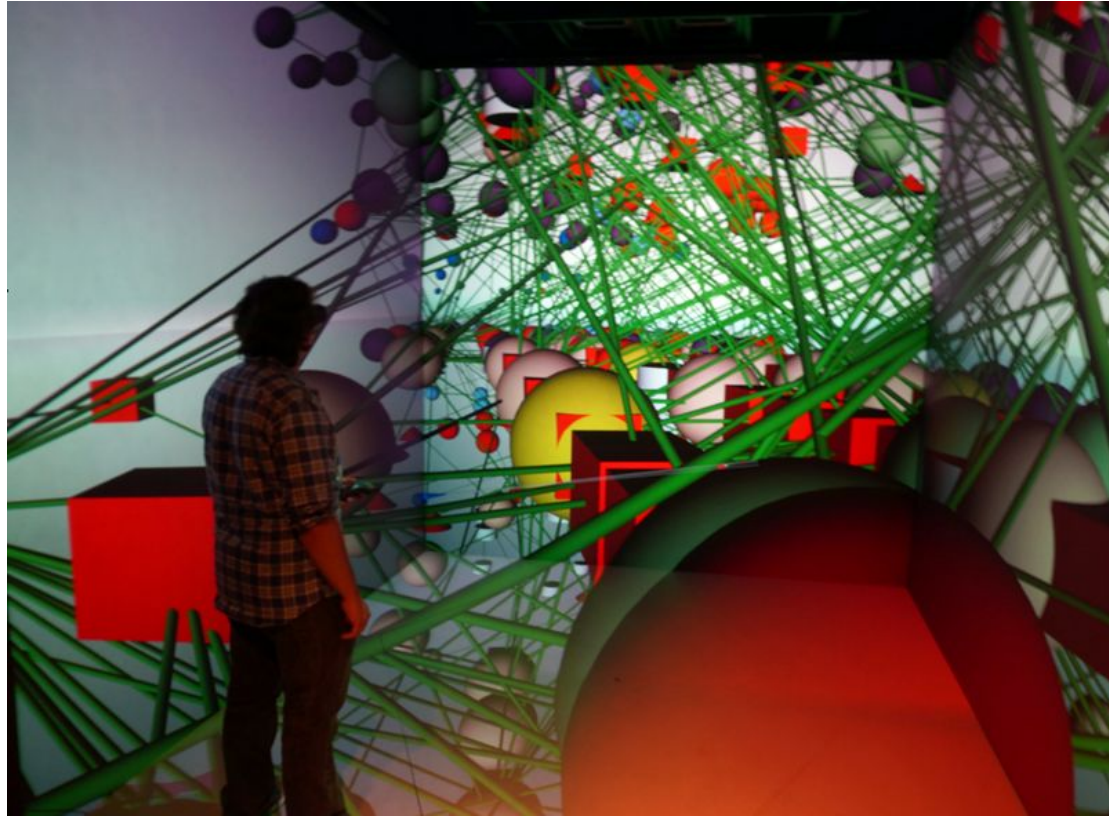
- Physics of DNA
- Agent-based immune system
- MPI_Blast results
- Network visualization



Compute the Cure (MPI-Blast)



Network Visualization



HL7, Informatics, and 3D

- Ed Hammond, Duke, HL7
- Electronic Health Records on FHIR!
- 3D data payloads of: DICOM, ... X3D

3DMD.com

- Chris Lane
- ... see attached slideset....
- High-resolution, high-throughput body scanning
- Importance of data ownership... consumer scan should be treated as private as a medical record@!

3D Repositories & X3D

- Enterprise & large-scale collections
- Metadata annotation in the scene
- Semantics & Ontology integration

Join Us!

The Web3D Consortium is a not-for-profit organization dedicated to 3D data durability and interchange. Medical Working group reaches across SDOs to harmonize standards.

www.Web3D.org/join