Final Projects 2020!

This is a list of potential final projects and some criteria for grading. This is your chance to apply all the things you learned this semester!

Please feel free to claim a project by adding your github username and email address! You can either join existing students to form a team (please make sure everybody wants that), or start a new team/solo effort. If there are multiple people working separately on the same project, a comparison for healthy competition will be part of the grading. **Team projects are certainly encouraged.**

Please also feel free to add your own project ideas. The teaching staff will then work with you to define deliverables and scores. In general, some projects might have a high potential for a straight A shortcut—this will be indicated.

Each project will include the following components:

- **Fast Forward** presented in class either live or as a video (30-60 seconds) that gives a very brief overview of the project, due 12/09/2020 1:00pm in class.

- **Final Project Presentation** in class (around 5 minutes) that gives a slightly longer introduction to the project, talks about current progress, and introduces the final deliverables. Presented on 12/14/2020 at 1:00pm in class by all team members (slots assigned via lottery).

- **Final Project Code** on Github, due 12/21/2020 at 11:59pm.

- **Final Project Report** on Overleaf (based on the Web3D conference template), due 12/21/2020 at 11:59pm.

WebGL Nyan Cat! There is a version online already (`https://cwacht.github.io/nyancat/`), but let's make a new one! Maybe UMass Boston themed!
Straight-A chance: low
Interested: haehn <haehn@cs.umb.edu>, namhoy24s <namho.yoon001@umb.edu>

Pixel-Art Scenes! Similar to assignment 2, we want to create pixel-art. This time, we want to load images and then render the image pixels as cubes (probably after downsampling). This has a potential as a new way of creating content or games.
Straight-A chance: high if a full-blown system exists, including the ability of defining different planes for a 2.5D effect. Because then, we might be able to submit it to Web3D
Interested: haehn <haehn@cs.umb.edu>, Ayah <ayah.aboelela001@umb.edu>,

Fix the local alignment bug in XTK! Warning: This can be hard to figure out but probably only involves little code changes.
Straight-A chance: high, if results are merged to XTK master
Interested: haehn <haehn@cs.umb.edu>,

2D/3D Animated Art! Anything goes that looks good.
Straight-A chance: only high, if results presented on the chrome experiments platform or for instance as a Three.js official

demo.
Interested: haehn <haehn@cs.umb.edu>, fmansour10 <freddy.mansour001@umb.edu>

OpenAnatomy Project 1: Volume Rendering! Create some volume rendering of OpenAnatomy data including transfer functions. It needs to use ray-casting! This can be done using Three.js or with vanilla WebGL (hard!).
Straight-A chance: high, if this gets added to the official platform.
Interested: haehn <haehn@cs.umb.edu>,

WebXR Demos! Anything goes that looks good..
Straight-A chance: only high, if results presented on the chrome experiments platform or for instance as a Three.js official demo.
Interested: haehn <haehn@cs.umb.edu>,

CS480 Intro We need an intro for the CS480 Biomedical Signal and Image Processing course (CS480.org). This intro shall be colorful, can use different technologies, but needs to use at least some WebGL.
Straight-A chance: high, if it will be used
Interested: Jakub Rodzik <jakub.rodzik001@umb.edu>, Alvin Lam <alvin.lam001@umb.edu>,
   Michael O'Toole <michael.otoole001@umb.edu>,
   Yue Sun <yue.sun001@umb.edu> and Fangda Chi <Fangda.Chi001@umb.edu>,

Mini-globe rendering for 360 videos! We can easily render the 360 videos with Three.js but it would be fantastic to add special rendering modes such as the mini-globe renderings (More info in the skybox lecture).
Straight-A chance: high, this might be used to capture 360 videos for all UMass Boston classrooms.
Interested: haehn <haehn@cs.umb.edu>,

Image processing with OpenCV.js and Dat.gui Use Dat.gui to show the effects of image processesing on an image in real time using opencv.js!
Straight-A chance: unknown, nobody knows
Interested: haehn <haehn@cs.umb.edu>,

Voxel creator Using Three.js to create a voxel model creator that can export obj or glTF files.!
Straight-A chance: unknown
Interested: haehn <haehn@cs.umb.edu>,

Journey to the West Use ThreeJs to create a light action role-playing game with some animation, play as the role 'Sun Wukong' who is from the Chinese fiction 'Journey to the West' to save his master named 'Tang Sanzang'.
Interested: Yiwei Yao <yiwei.yao001@umb.edu>

Bird Flocking A Three.js powered implementation of the boids algorithm
Interested: Neha Goyal <neha.goyal001@umb.edu>

Audio Visualizer Make an audio visualizer that looks cool.
Straight-A chance: unknown, maybe if people like it
Interested: Xu Huang Lin <xuhuang.lin001@umb.edu>, Pengbo Xing <pengbo.xing001@umb.edu>

Shadow mapping in a 3D WebGL model: Making animation in which a moving light casts shadow of objects around.
Interested: Anees Rehman <aneesur.rehman001@umb.edu>, Thuc <dangluong.nguyen001@umb.edu>, Jesh Amera <yeshiwas.amera001@umb.edu>

3D Visualization of a building : Interactive 3d visualization of one of the campus building using XeoKit framework
Interested: Shivam Gupta <Shivam.Gupta001@umb.edu>, Nandinii Yeleswarapu <N.Yeleswarapu001@umb.edu>

3D animated: Neon artwork: Create an aesthetic scene with neon shaders. I'm thinking of making the aesthetic similar to Vaporwave.
Interested: William Hem <William.Hem001umb.edu>

3D Lootbox Simulator : Making a Three.JS game surrounding around only the loot box aspect of games. Roll as much as you desire with no money required. Saving the world from EA
Straight-A Chance: Saving people from gambling addiction, maybe a chance?
Interested: Matthew Soohoo <Matthew.Soohoo001@umb.edu>, Michael Soohoo <Michael.Soohoo001@umb.edu>

MRI data visualizer with WEBGL : Use sliders in dat.GUI to easily view X, Y, Z slices from MRI data.
Interested: Dennis Liew <ZhenRong.Liew001@umb.edu>

Paper Toss Game! Use Threejs to create a game where you try to throw a piece of paper into a bin. The bin will move around and there might be a wind component to it. The goal is to get the highest score!
Straight-A chance: Yes, because it's going to be really fun!
Interested: Tony Chau <tony.chau002@umb.edu>,

WebGL pathtracing renderer Path/ray tracing renderer with accurate lighting effects, reflections, and refractions. I've seen some demos around, but I haven't seen any that can render real models, I want to see if I can make one (or failing that convert models into primitives)
Interested: Paul Maynard <Paul.Maynard001@umb.edu>,

3D avatar and animation Develop portfolio by creating 3D avatar and giving animations to it . Planning to use Blender for UV mapping for realistic look and WebGL using three.js.
Interested: Shruti Ghelani <s.ghelani001@umb.edu>,

Solar System in Motion:Develop ecliptic orbits of all the planets in our solar system with the Sun moving in ecliptic circular too and show their traces in the Global coordinates.
Interested: xiaoqian.zhang001@umb.edu and haoyu.wang001@umb.edu

Solar System in Time Model the solar system using physics equations. The momentum principle and gravity calculations will be used to model the planets moving around the sun. Attempt to use NASA data to sync up planetary positions to a specific point in time, then move forwards or backwards through time to anticipate moments of particular interest.
Straight-A chance: Unknown
Interested: JamesEdMichaud <james.michaud001@umb.edu>,