Rhino, Maya and Blender

By Victoria Valdes

RHINO

Advantages:

- Platform with which Victoria is most familiar
- Can output files in almost any format
- Used extensively by A-school
- Best for creating architecture from scratch based on plans and diagrams.
- Fairly easy to troubleshoot
- Easy command line inputs once you know the commands
- Plenty of online tips and fixes; doesn't change too much over time, so tips for older versions tend to remain relevant
- Easy to import graphics from Illustrator
- Python compatible

Disadvantages:

- Does not lend itself to animation or moviemaking
- Difficult to create soft/irregular surfaces
- Unintuitive
- Cost is $100 to students

Ideal projects:

- Building structures that don't require animation

MAYA

Advantages:

- Massive, diverse functions include moviemaking/animation, rigging, modeling, rendering, advanced lighting, etc.
- Free to students
- Exceptional character building and animation which is almost infinitely customizable
- Handles complex textures, UV mapping, with plenty of good tutorials
- Easily simulates collisions, gravity, weather conditions
- Python compatible but oriented towards its own script "MEL"

Disadvantages:

- UI often changes, without much documentation. Tutorials quickly go out of date. Troubleshooting or tips found online are often irrelevant.
- Prone to errors and crashes.

Ideal projects:

- Complex animations
- Building renderings that require specific lighting conditions
- Full “scenes” with background characters/landscape/etc

BLENDER

Advantages:

- Very similar functionality and interface to Maya. Users of one platform may find it fairly easy to pick up the other.
- Free to everyone.
- Massive user community that frequently creates free plug-ins for difficult operations.
- Well known tutorial series (“Blender Guru”) that consistently updates when software updates.
- Python compatible
- Renderings, while slightly less powerful than Maya, are faster and less prone to crash

Disadvantages:

- Slightly more unintuitive controls than Maya; this is somewhat alleviated by various printable “cheat sheets” online
- Not commonly taught at UVA

Ideal projects:

- More straightforward animations
- Highly realistic textures
- 3D modeling irregular surfaces

Note:

Both Maya and Blender have incredibly layered user interfaces. You can put 100+ hours in on either and barely scratch the surface of their functionality. Rhino is a little more straightforward; it has a more limited scope but it’s a little easier to grasp its functionality. None of these are appropriate for a beginner, I’d recommend Sketchup or similar if you need a software that your user can really get the hang of in a few weeks. Generally, Rhino/Maya/Blender are best for projects that need to be complete and finished presentations, rather than sandbox projects that can be tweaked or redesigned by the end user.

Matterport, Kunstmatrix, and Google Sketchup

By Dan Weiss

MATTERPORT

- 3D digital twins
- 4K print quality photos
- Guided video tours
- OBJ, XYZ, JPG, and PDF files
- Upload the imagery to Google Street View.
- Associate the imagery to the correct business in GSV.
- Geolocate the property accurately on the Google map.
- Pricing and Plans
- You get one active space for Free if you want to fiddle with it.
- Can use with iPhone 6s or later
- Can't seem to import 3D objects or modify the walls at all.

Good for: Scanning an exhibition that already exists.
Cons: virtually no editing capabilities, cost

KUNSTMATRIX

- Starter account: 10 works of art
- Handful of exhibition spaces to choose from
- Pricing Plan
- 3D Objects? Still looking into this. There is an option to make something 3D, but it does not seem to accept standard 3D file types.
- Can try real spaces with the KUIO App

Good for: Real easy for students to import works and put them on the walls of an imagined space without a lot of fuss over scale.

Cons: limited space editing and selection, cost if you want to do more

Google SketchUp

Pros

- Create spaces from the ground up.
- Massive editing capabilities
- FREE

- Can recreate existing spaces with real world issues and limitations

Cons

- Interface is a bit clunky
- Difficult to set parameters to avoid a viewer from going through walls
- Can easily alter the model on accident
- Difficult to navigate as a viewer

Creating Virtual Art Galleries with Mozilla Spoke and Hubs

By Justin Greenlee

Spoke + Hubs

One way to create a custom virtual art gallery AND install works of art in that gallery—models of paintings and sculptures and/or audio and video files—is via Spoke by Mozilla. Spoke has multiple capabilities. You can:

(1) create architectural shapes (NOT according to pre-existing dimensions) without any external software or prior 3D modeling experience;

(2) explore images, videos, and 3D models from around the web by importing them into your digital art gallery;

(3) install works of art on the wall of a virtual art gallery by importing image files and put 3D models of sculptures on pedestals at an *approximate* scale with ease. You could do this, precisely, based on ratios and the dimensions of your wall relative to the work of art.

(3) publish your virtual art gallery from Mozilla Spoke to Mozilla Hubs, where it can be viewed and experienced in multiple ways, including in 2D on your laptop or smartphone, standalone VR, or a mobile phone powered VR system.

To get a sense of how Spoke functions as a 3D editor, you can view my video on YouTube, here. It is a partial recording of a Zoom session with Jason Bennett of the Learning Design & Technology team at UVA. To view an introductory tutorial for new Spoke users, click here.

Hubs, Only

It is also possible to install works of art on the walls of a virtual gallery in Mozilla Hubs, directly, rather than making these additions part of the design process in Spoke and then publishing to Hubs. However, the ability to manipulate these installs in Hubs, alone, decreases dramatically compared to Spokes. To get a sense of how the installation of works of art functions in Hubs, view my video on YouTube, here (note: there is no sound). The two walls of the virtual gallery shown in the video were created ahead of time in Spoke, published to Hubs, and then shared via a unique "room code" that brings virtual visitors into the space.

Recommendations

If you would like your STUDENTS to create the architectural shape of the virtual art gallery, I recommend Mozilla Spoke over more advanced (and costly) 3D modeling software such as Maya and Rhino 6. If you would like SOMEONE ELSE to create the virtual art gallery—one that would serve as a template, with the file distributed to each student—it may be possible to create a model for the space in, say, Google Sketchup and then import that file into Spoke for the installation of works of art by students. More research is needed on this point. Regardless of who creates the virtual art gallery, I do recommend installing the works in Spoke and then publishing to Hubs, rather than trying to install them in Hubs, given the lack of features for editing.

Pros and Cons of Mozilla Spoke and Hubs

Pros

-- Spoke is a free 3D editor

-- Spoke is built for beginners

-- Spoke is compatible with Windows and iOS (Mac) operating systems

-- Spoke presents an alternative to advanced 3D modeling software

-- Spoke does not require additional installs, be it applications, software, or platforms. You simply need to provide your email to sign up for an account

-- You can build architectural spaces in Spoke using their "Architecture Kit," including installing floors, walls, doors, windows, and a roof

-- You can also upload 3D models, images, videos, and audio to your virtual art gallery as "assets" in Spoke and install them on the walls

-- Spoke has search integrations with Sketchfab and Google Poly, which foregoes the process of having to visit those sites, download an object file, and upload those to Spoke

-- You can put a 3D model of an artwork on a virtual pedestal in Spoke

-- Once your Spoke design is complete, you can publish it to Mozilla Hubs. After publishing, you "create a room" that makes it available to others to view, via a private room code and/or URL. Other can then visit https://hubs.mozilla.com/ and type in the related room code to experience the virtual space in 2D via screen mode on a laptop or mobile device, standalone VR, or a mobile phone-powered VR system

Cons

-- Spoke files need to saved, manually, to the "Projects" page of your Spokes account. There is no autosave. If you navigate away from the 3D editor of Spokes without saving your work it will be lost.

-- A Spoke project cannot be worked on by more than one person, simultaneously. Students can collaborate on a single project, however, if they share an account and login information.

-- There is a necessary adjustment period to learning the controls that help a user move around the virtual environment in Spokes (using a mouse and keyboard)

-- There is also a learning curve to the functionality of Spokes as a 3D editor, be it the architectural space or the manipulation of assets like models, images, videos, and audio

Unclear; more research needed

-- It is unclear if you can migrate and then edit 3D files from Spoke to another 3D modeling program. It is possible to export files from Spoke, save them to your personal computer in .glb format, and view them using another software; but it is unclear if you could edit individual components of those files successfully.

-- It is unclear if you can upload a 3D model of a virtual art gallery from, say, Google Sketchfab, scale it to your desired size, and then install 3D objects or .jpegs in that space

-- It is also unclear if you set a user on a rail in Spoke and enable fixed tracking that prevents the viewer from disappearing below the floor, through the wall, or into the sky.