

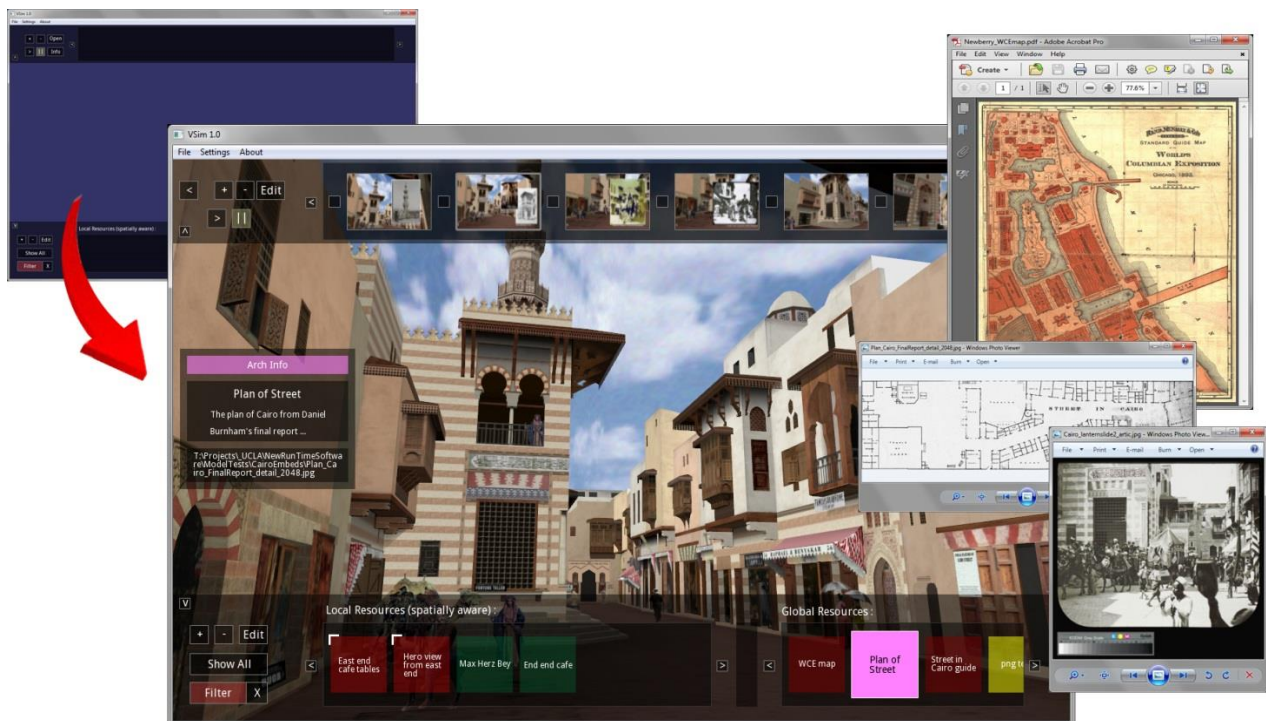
VSim 1.0 User Guide and Notes on Best Practices

Last updated 6/13/2013 by Lisa M. Snyder (lms@idre.ucla.edu)

The VSim prototype is generalizable and extensible software that allows real-time exploration of highly detailed, three-dimensional computer models in both formal and informal educational settings. The prototype was funded by a National Endowment for the Humanities Start-Up Grant (#HD-50958-10) and the Institute for Digital Research and Education at the University of California, Los Angeles.

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The VSim prototype is a flexible piece of software for interacting with three-dimensional content in educational settings. At first launch, the software appears deceptively simple (upper left image), but it facilitates sophisticated interactions with academically generated real-time models. Above, the Street of Cairo installation from the Urban Simulation Team's reconstruction of Chicago's World's Columbian Exposition of 1893 is shown in a screenshot captured during a flight session. The narrative bar across the top shows thumbnails from a linear presentation describing the construction of the concession and the embedded resources bar across the bottom shows the spatially organized material available for interrogation by the user from that location in the model. Three open windows (at right) show launched resources from the Newberry Library and the Art Institute of Chicago.

VSim 1.0 User Guide and Notes on Best Practices

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The following is a list of recommendations for working with VSim version 1.0 to successfully interact with three-dimensional content as part of your research or classroom presentations. VSim has three major components: the general navigation tools and settings, the Narrative element, and the Embedded Resource element. The **general navigation tools** facilitate real-time interaction with 3D content in gaming (WASD), flight simulation, or Google Earth-style object rotation modes. The **Narrative** section allows you to create a linear presentation akin to PowerPoint or Prezi, but within virtual space. The **Embedded Resource** section allows you to embed annotations, web links, or files containing primary and secondary resources within the modeled environment. These three components can be used individually or combined for a powerful teaching and learning experience.

Use VSim to ...

- Explore 3D content, whether it's your own computer model, a colleague's, or a model from the Trimble 3D warehouse.
- Create presentations within the virtual space using the Narrative feature.
- Embed primary and secondary resources within the virtual space to augment your narrative presentation.
- Embed resources and annotations within the virtual space to create a rich interactive user experience.
- Export models in the .vsim format for sharing with students, colleagues, and peer reviewers.
- Craft an academic argument within the 3D space using some combination of the linear narratives, the embedded resources, and the annotations.
- Export narratives for sharing with colleagues and students.
- Create assignments for students that feature 3D content (i.e., building and interacting with computer models, creating presentations with existing content, exploring 3D content as the basis for an academic paper, etc.).
- Package 3D content for peer review.

Things to understand before you start

- VSim can load raw model files in .dae and .flt formats. Most modeling packages today can export in the .dae (aka COLLADA) format; to 'fly' your own model, you'll need to export a .dae file first. If you want to 'fly' something from Trimble's 3D warehouse, download the .dae zip file and extract that, or download the Sketch Up file, open it in Sketch Up and then export a .dae file.
- VSim can export the textures and geometry from these raw model files into a single file in the .vsim format. This is to facilitate sharing and address concerns that content creators might have about releasing raw files (i.e., their intellectual property). If desirable, this .vsim file can contain narratives and embedded resources.
- Narratives and Embedded Resources can be exported as stand-alone files with the .nar or .ere extensions, or can be exported within a .vsim file. (If you're sharing your own model, you might want to export a .vsim file that includes multiple narratives; if students are building narratives for an assignment, they might turn in just the .nar file.)

- 'Import Narrative' from the File menu to load a narrative into the current simulation session. This can be a .nar file that you've created or one that has been built by a colleague. Multiple narratives can be loaded at the same time.
- 'Export Narrative' from the File menu to save a selected narrative; all node information (i.e., location, text, fonts, and imagery) is saved within the .nar file.
- 'Import Embedded Resource' from the File menu load an Embedded Resource file into the current simulation session. This overwrites any resources already loaded.
- 'Export Embedded Resource' from the File menu to save the embedded resources currently loaded in the model; only text and file paths are saved within the .ere file. (In other words, an .ere file for distribution should include primarily annotations and web links; any associated files must be packaged and distributed separately and will only launch successfully if the file path to the new location exactly matches the path in the .ere file.)

Before all else, learn the navigation controls.

- When in doubt, hit the spacebar. The spacebar is a toggle that either freezes the scene so that you can interact with narratives and embedded resources, or puts you into navigation mode so that you can interact with the computer model.
- Keep your cursor near the center of the simulation window when you're navigating. (The speed of any movement is relative to the cursor's offset from the center of the screen: with the cursor at the center of the screen, motion will be minimal; putting your cursor along the edge of the screen will result in a fast spin.)
- On initial load of raw model files, you will be positioned looking down at 0,0,0 ... this will be changed in the release build. Until then, to find your model: press the spacebar to toggle to navigate and '2' for uSim navigation; use the mouse to look around. You may need to press 'f' so that you can fly to your model. (A pleasing start position can be set prior to exporting .vsim files.)
- Remember this software is a prototype. We hope to get more funding to continue development. You can help us define new features and identify bugs. If you think of something that would be great to add, please let us know. If you hit a problem, please help us by figuring out how to reproduce the error. (The best information you can give us is a simple equation: "Every time I *(fill in the blank with action or series of actions)*, then the software *(fill in the blank with error)*."

Things to do to avoid known issues (AKA bugs)

- If you've just added an embedded resources and the software starts to accelerate in an out-of-control fashion, the way to get it back under control is to slightly accelerate yourself (left mouse) and then decelerate (right mouse).
- The four font styles were intended to be totally customizable. There are seven style attributes: Font, Size, Color, Opacity, Drop Shadow (On/Off), Background Screen Opacity, and Background Color. Most of these can be changed through the 'Settings -> Fonts and Colors' menu. Unfortunately, changing the Fonts and Sizes are buggy in the prototype. The font and sizes cannot be changed for Heading 2, Body, and Label; and the only way to change the font and size for Heading 1 is to change the font and size for the Label style (yes, that's right ... changing the Label font and size actually changes the Heading 1 style ... I hate software development!)
- There are annoying behaviors regarding the nodes while building a long narrative (see note above).

Remember ... this software is a prototype ... be gentle with it!

Navigation

General software control keys

On launch, VSim is set to first person navigation (WASD); press the spacebar to toggle to navigate and begin moving around

1 – Invokes First person navigation (gamer interaction, aka WASD)

2 – Invokes uSim navigation (aka flight simulation)

3 – Invokes Object navigation (Google Earth-style manipulation)

Spacebar – in modes 1 and 2, toggles between Freeze and Navigate (necessary for interaction with the Narrative and Embedded Resource controls)

c – Toggles collision on and off (also creates a snapshot in the same folder as VSim.exe)

The TEXT version of the VSim navigation instructions

1= First person navigation (WASD)

w – Forward movement

s – Backward

a – Strafe left

d – Strafe right

r – Toggles between slow and fast speed

Use the mouse to look around; the mouse buttons don't do anything

g – Ground (user is tethered to the ground)

f – Fly

Shift-t – Toggles to third person view and shows the collision shape

2 = uSim navigation (flight simulation)

Use the mouse to both govern where you look and how fast you move

Use the mouse to look around; keep your cursor close to the center of the simulation window to maintain control

Left mouse button – Forward thrust (accelerates forward)

Right mouse button – Reverse thrust (accelerates in reverse)

Center mouse button – Stops movement

Spacebar – Toggles between Freeze and Navigate

g – Ground (user is tethered to the ground)

f – Fly

Shift-t – Toggles to third person view and shows the collision shape

Pressing Shift while moving - Maintains current direction of movement yet enables you to look around (this is just enables more sophisticated visuals while in free flight)

3 =Object navigation (Google Earth-style movement)

Left mouse and drag – Rotates model

Center mouse and drag – Strafes; also moves the center of rotation

Right mouse and drag – Zooms in/out

The GRAPHIC version of the VSim navigation instructions

1 = First person navigation (WASD)

Press to move

Guides where you look

Space **Toggles between Freeze/Navigate**

R **Toggles between Slow/Fast speed**

G **Tethers you to the GROUND**

F **Allows you to FLY**

3 = Object navigation (Google Earth style)

Press and drag to spin

Press and drag to pull in and out

Press and drag to strafe (Also repositions center of 'spin' on release)

2 = USim navigation (flight simulation mode)

Forward thrust*

Reverse thrust*

Stops motion

Guides where you look**

** Speed increases exponentially as button is held down (go easy!)*

*** Best if you keep your cursor close to the center of the simulation window*

Space **Toggles between Freeze/Navigate**

G **Tethers you to the GROUND**

F **Allows you to FLY**

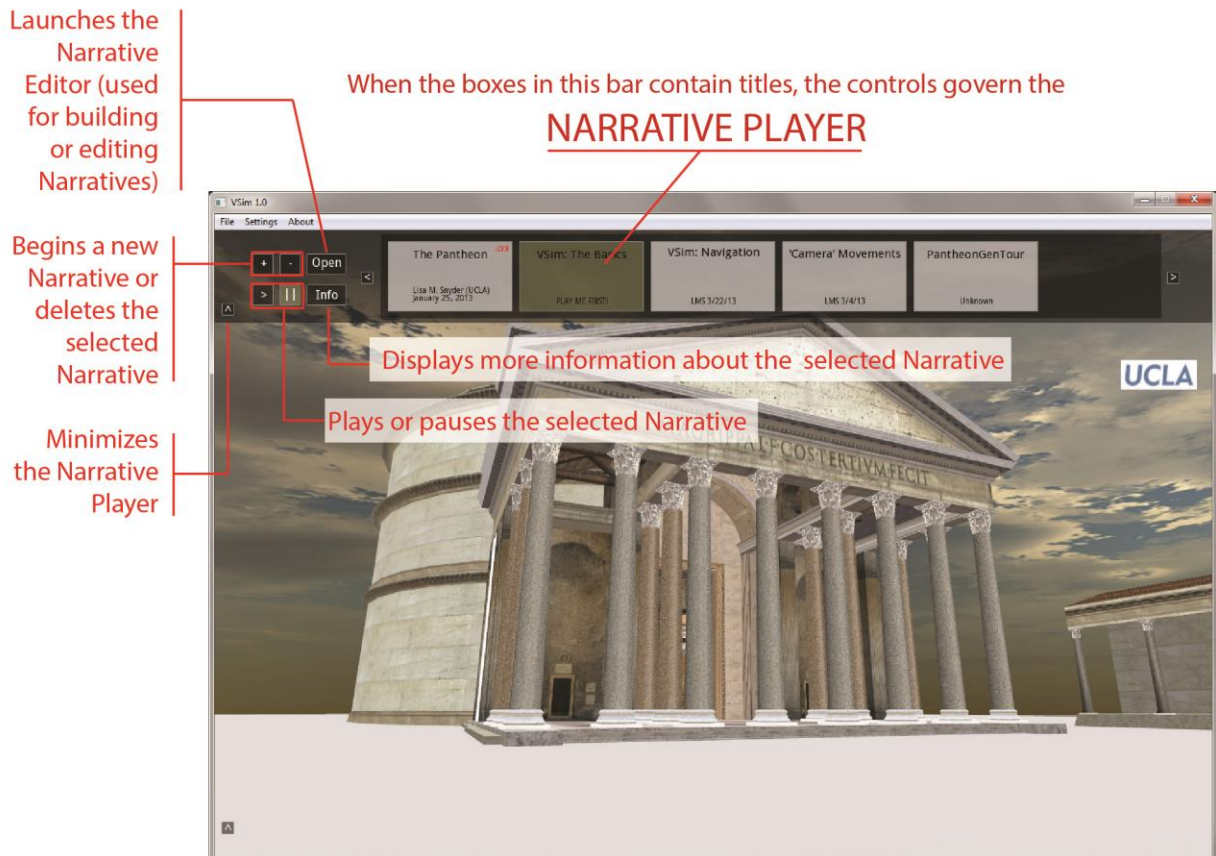
Narratives

General comments

- The Narrative feature of VSim was specifically constructed for classroom presentations. Think of building a narrative like building a PowerPoint or Prezi presentation, but in 3D space.
 - There are three components of the Narrative feature: the Narrative Player, the Narrative Editor, and the Node Editor.
 - The **Narrative Player** is the main bar across the top. If narratives are loaded, you'll see their titles in the boxes. Click one to select it, then you can play and pause it, or open it (if not locked)
 - The **Narrative Editor** shows you each of the nodes of the narrative and lets you add and delete nodes, use the **Node Editor** to add overlay text and images, and adjust timing on the nodes and for the transitions between them.
 - The 'down arrow' in the upper left of the screen hides and reveals the Narrative Bar
 - Narratives can be included with a model file, or can be distributed independently.
 - If distributed independently, narratives are brought into the simulation session through the 'File -> Import Narrative' command.
 - In the 'Settings -> Content Creator' menu there is a radio button to invoke a 'Narrative loop.' If the narrative loop is on, VSim will play through the loaded narratives, one after another.
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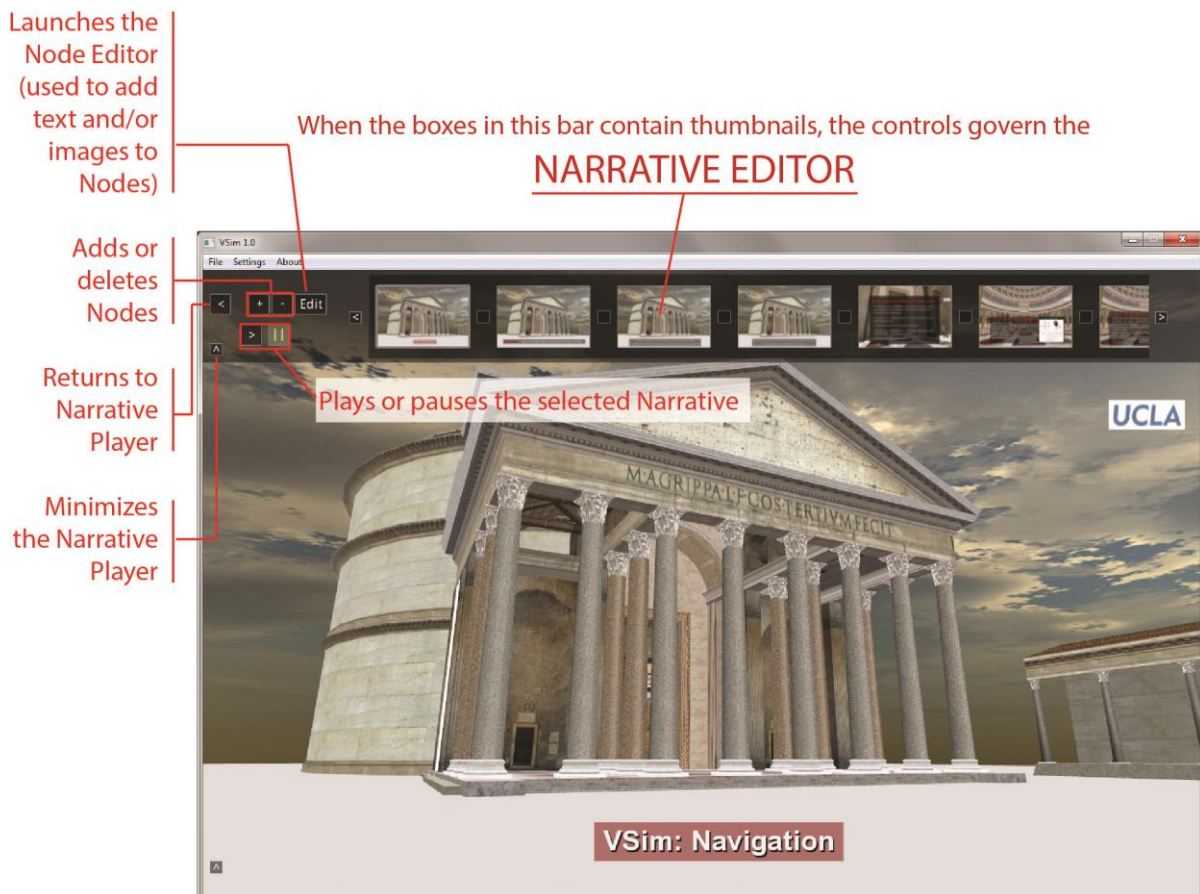
THE NARRATIVE PLAYER

- If you downloaded any of the pre-built narratives, play with those before you try to build your own.
- Click on one of the narratives shown on the bar (the boxes with the titles in them)
 - Click play (the box on the bar with the > symbol) (hide the Narrative bar if you want)
 - Watch the sequence play
 - To pause, press 'p' or click the pause key on the Narrative Player (the box with the || symbol)
 - To continue the narrative after pausing, pressing 'p' again
 - To start the narrative back at the beginning, press the play key on the Narrative Player controls
 - If you leave the narrative and move around in free flight for a while, pressing 'p' will resume playing the narrative where you left it.
 - If the narrative node is set with a 'stay on node until 'P' is pressed' flag, the simulation will sit on that node until play ('p') is hit
 - If you want to replay a narrative, double click the > symbol (NOTE: confirm, but this may start the narrative on the second node ... bug)
 - Specifically explore how you can use the narrative nodes as jump points, how you can shift from the narrative to free flight and back, how adding and deleting nodes impacts the narrative, how you change the timing of transitions, pause times on nodes, how you add text and images, and how you export the narrative to save your work.



THE NARRATIVE EDITOR

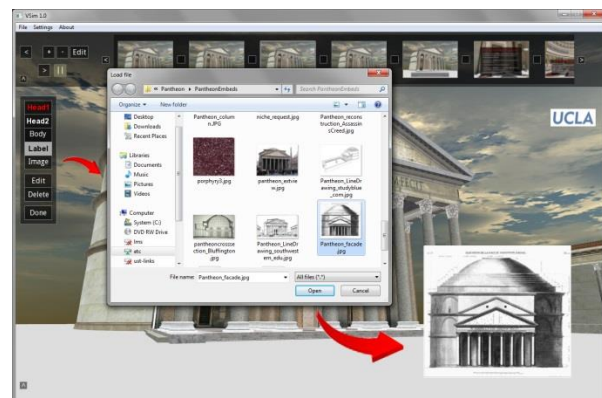
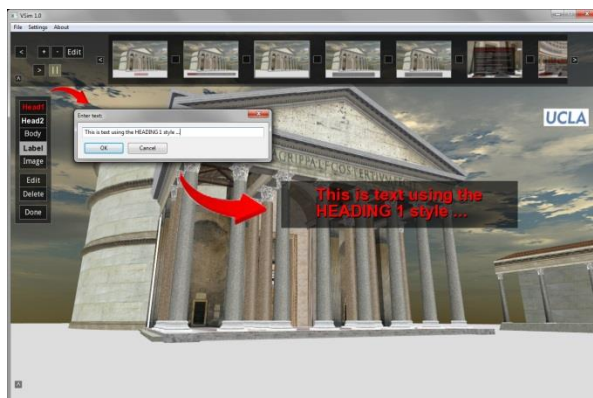
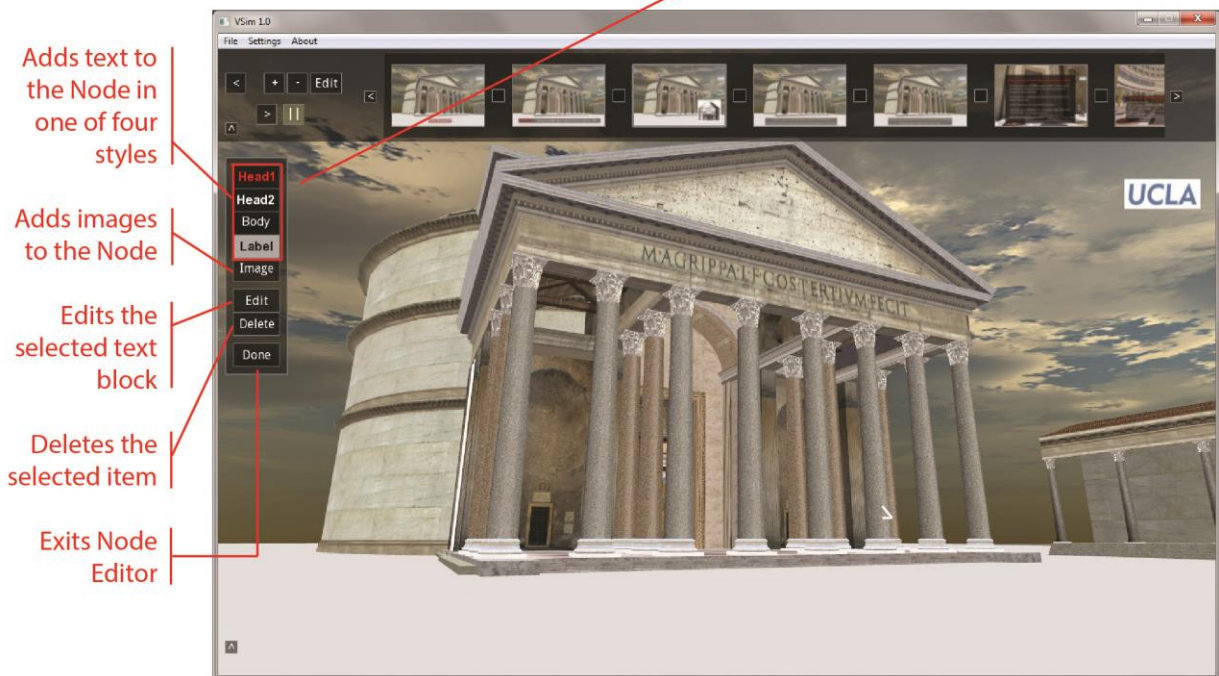
- Shows the individual thumbnails that make up the Narrative
- Click any node to jump to that scene
- Pressing play will start playback beginning at the selected node; hitting pause and play will resume action at the active node
- If the narrative node is set with a 'stay on node until 'P' is pressed' flag, the simulation will sit on that node until play ('p') is hit
- Double-clicking on a node allows you to adjust the pause time (the amount of time spent on that node during playback) or choose the 'stay on node until 'P' is pressed' flag.
- Double-clicking on the transition (the box between nodes) allows you adjust the transition time (the amount of time it will take to move between neighboring nodes).
- With a node selected, click Edit to add/move text and/or imagery onto the node)



THE NODE EDITOR

- Pick a type style to add a text element (type in text window; click OK; left-click-drag on text to move the line).
- To move text, your cursor has to be on the text, or it won't work
- Text can be edited, moved, and deleted, but the style can't be changed after the text has been added
- Click 'Image' to add an image to the node (browse for image, select file, press Open ... left-click-drag to move image; left-click-drag lower right corner to re-size)
- Once placed, images can be re-sized, moved, and deleted

When this bar is visible, only the NODE EDITOR controls are functional



Creating your own Narrative

- Reveal (or navigate back to) the Narrative Player
- Freeze the scene and press the '+' key
- Give it a title, add a description, and your name (the title and your name will show on the Narrative Player; all three elements will show if 'Info' is clicked)
- With the new narrative highlighted, click 'Edit'
- Navigate to your desired start point ... hit the spacebar to freeze the scene ... press '+' to place your first node
- Best to use WASD or flight simulation navigation for this process. (There's no way to freeze the scene in mode 3 ... if you insist, use mode 3 to find your desired node location, invoke one of the other navigation modes, hit the spacebar to freeze the scene, and then press '+')
- I'd recommend putting two nodes in the same location at the beginning and at the end (this is to compensate for some weirdness on playback)
- Fly around, hit spacebar to freeze the scene, and add nodes as you'd like.
- Click on a node and press '>' to play the thing ...
- New nodes are added to the right of the selected node
- To save a narrative, it must be exported. Choose 'File -> Export Narrative' and browse for the desired location.
- Click on the first node before you return to the Narrative Player or export your narrative (this is to set the first node as the start point on playback)
- Export your narrative often to save your work
- On export of narratives, VSim asks if the file is to be locked or not. The default is NO. This saves a file that can be read and edited by anyone. Locking a file creates a READ ONLY file that can't be edited. There is no unlocking a locked narrative.

Best practices for building a Narrative

STEP 1: Plan your narrative

- Have a plan for how you want to use the 3D content and what route you want to take through the virtual space.
- Identify any images that you want to use in the narrative and resize them if necessary. (When you save a narrative, all images are packaged in the file; using huge image files will increase the size of your .nar file.)
- Images should ideally be no greater than 1000 pixels on their largest side. (You can import larger, but you'll have to scale them a lot and super big images might be slow to load.)
- As you build your narrative, export it occasionally to save your work.
- If you're making a long narrative, best to split it into smaller narratives to make your life easier

STEP 2: Layout your route by adding nodes

- Either start from scratch by creating and naming a new narrative or create a copy and rename an existing narrative that you'll import into VSim and modify for your new presentation.
- Move through the 3D space and add all of your primary nodes (to establish the basic flow of the presentation).
- The composition for each node should be carefully considered to account for planned text blocks and overlay images.

- **As you add nodes, VSim will connect the nodes to make a linear path, add a 4 second default pause time on nodes, and add a 4 second default time for the transition to the next node.**
- Double click on the nodes and transitions to adjust the timing of the narrative, but only after you're happy with the route; you can also set individual nodes to pause on that node until a key press.
- Play your narrative and add more nodes as necessary to keep from slamming through walls on playback – unless that's what you want to do.
- That said, try to use as few nodes as possible. (Adding too many creates an overly complicated narrative that will be difficult to use).
- If you're building a long narrative (more than 15-20 nodes), consider breaking it up into a few shorter narratives (this is only to save yourself some headaches).
- Plan to disengage from the narrative occasionally and interact with the model in free flight mode.

STEP 3: Add text and images to your narrative nodes

- Manipulate the VSim window so that it is the same size as your intended projection resolution. This is so that added text and image elements will properly align when projected. The position of the text and images are relative to the lower left corner; if you change the size and ratio of the window after making a narrative, the positions of the overlay items may be incorrect).
- There are four 'styles' available: Heading 1, Heading 2, Body, and Label. We've set defaults for these; but you can change them through 'Settings -> Fonts and Colors.' (Adjust your styles before you build your narrative because you can't change text attributes after the fact ... and see bug note on page 3 about changing fonts and sizes.)
- Our font style defaults include background screens so that the text elements more legible.
- Images can be resized by dragging on their lower right corner (sorry, no way to lock proportions yet).

STEP 4: Finesse your presentation

- Adjust the pause time on each node so that playback is appropriate for your presentation (alternately, set the 'wait until keypress' flag on each node so that the simulation pauses on that node until you press play ('p') to move on).
- Add and/or delete nodes as needed to transition smoothly around objects in the 3D space.
- Adjust the transition timing only after your nodes are done to your satisfaction (playback will be quicker as you work on the presentation).
- Text elements can be moved, edited, and deleted; images can be moved, resized, and deleted.
- If you add or delete nodes, always check the surrounding transitions to make sure they're as desired.

Narrative tricks

- Narratives don't always have to include motion ... use the nodes as you would jump points
- Add multiple nodes at the same location to sequence text display in a narrative
- Play with sophisticated motions by strategically placing nodes and thinking about the viewing angles.
- Use added imagery for points of comparisons or to augment the model (best positioned to show both the model and the overlay image ... or use multiple nodes at the same location, one with the overlay image and one without).
- Be mindful of the position of your node elements. Best to leave a safe zone around the edges of the simulation window to accommodate the Narrative and Embedded Resource bars and the annotation displays along the sides.
- Review your narrative and delete extraneous nodes (again, to save yourself some headaches).
- Double check your narrative once you're hooked up to the projection system.

Embedded Resources

General comments

- We've conceptualized the embedded resources as more of a fixed supplement to a given environment. The resource file will likely be built once and then only occasionally augmented.
- The software allows the content to be broken into user-defined categories and it is expected that these categories will vary from environment to environment (e.g., the categories for one environment might be Photos, Line Drawings, Rendering, News Articles, and Annotations; for another environment it might be Inscriptions, Reconstruction Notes, and Paintings).
- Single clicking on a resource displays the resource description along the left side of the simulation window
- Double clicking on a resource launches the default program associated with that file type. Tested file types include .jpg, websites, .pdfs, .mid, .rtf ... others probably work, but haven't been tested.
- There are two ways to look at the resources: the primary Embedded Resource viewer (resources are displayed according to their settings), the Resource Manager (SHOW ALL) (resources can be searched and/or viewed by category, setting, type, or title)
- The user can filter the resources to customize their experience
- Resources can be identified as **global** (they will always be available in the world) or **local** (they are only visible when the user is near the spatial center for that resource)
- A model can be distributed with Embedded Resources or an Embedded Resource file can be distributed independently
- To save an Embedded Resource file, it must be exported. Choose 'File -> Export Embedded Resource' and browse for the desired location.
- On export of Embedded Resources, VSim asks if the file is to be locked or not. The default is NO. This saves a file that can be read and edited by anyone. Locking a file creates a READ ONLY file that can't be edited. There is no unlocking a locked resource file.
- **Locking a file for distribution only preserves the annotations and links to URLs.** This was done purposefully as a way to minimize the size of the exported .ere file. (Lots of embedded resources could generate a HUGE file ... just be mindful of the logic of the export.)
- The resource file saves the full path to associated files. If these files are moved, the resource file link will be broken.
- In an unlocked resource file, the paths to resources can be edited in Textpad or similar. This may be desirable if you are creating a zip file for distribution and want to ensure your resources will work when unzipped.

THE EMBEDDED RESOURCE VIEWER

- The 'v' icon in the lower left corner of the simulation window hides and reveals the Embedded Resources bar
- The left section shows spatially linked (aka local) resources; the section to the right shows global resources.
- Single clicking a resource will display its title, category, and description in a pop-up display on the left side of the simulation window
- Right mouse click to remove the resource description
- Double clicking a resource will launch it using the program your system believes is the default program for that file type.
- Once launched, resources must be managed outside of VSim (i.e., the Windows Picture Viewer must be manually moved, closed, etc.). This allows the user to control the information.
- A white line on the corner of the resource indicates that the user will be repositioned when that resource is launched
- '+' and '-' adds and deletes resources
- 'Edit' opens the resource description/metadata for editing

The bar along the bottom controls any EMBEDDED RESOURCES (ER)

Click resource titles once to display description; double click to launch

Hides the ER bar

Adds or deletes resources

Displays all resources so they can be easily managed

Allows the user to filter the resources that are displayed during interaction

Clears filtering (if filtering is on, the background is green)

LOCAL resources are active only when user is near their point of origin

Click to adjust Local/Global display ratio

GLOBAL resources are active at all times during the simulation session

MANAGING RESOURCES (SHOW ALL)

- 'Show All' toggles display of the Embedded Resource bar to an alternate display for reviewing the embedded resources. Clicking on 'File Title,' 'File Type,' 'Category,' 'Global,' or 'Local' will display the embedded resources in those different ways. Embedded resources can also be added, deleted, or edited from this deck.
- Single click on the sort option to begin drilling down into the resources (i.e., single click on 'Category' to display the various category names)
- Double click on the option breakdown to see all resources thus organized (e.g., all resources under a single category name)
- A search feature is accessible from the 'Show All' bar.

Clicking **SHOW ALL** opens up different ways to manage resources

Options for resource display

Searches against resource title and description fields

Hides the ER bar

Adds or deletes resources

Returns to the primary Embedded Resources bar

Edits the metadata for the selected resource or category

Double click to see all resources

Category	Global	Local	FileType	Title
1893 Photos (4)	Watercolors (2)	Ephemera (4)	Author Notes (29)	Arch Info (1)
Street of Cairo (16)	Art Institute (5)	L of Congress (5)		

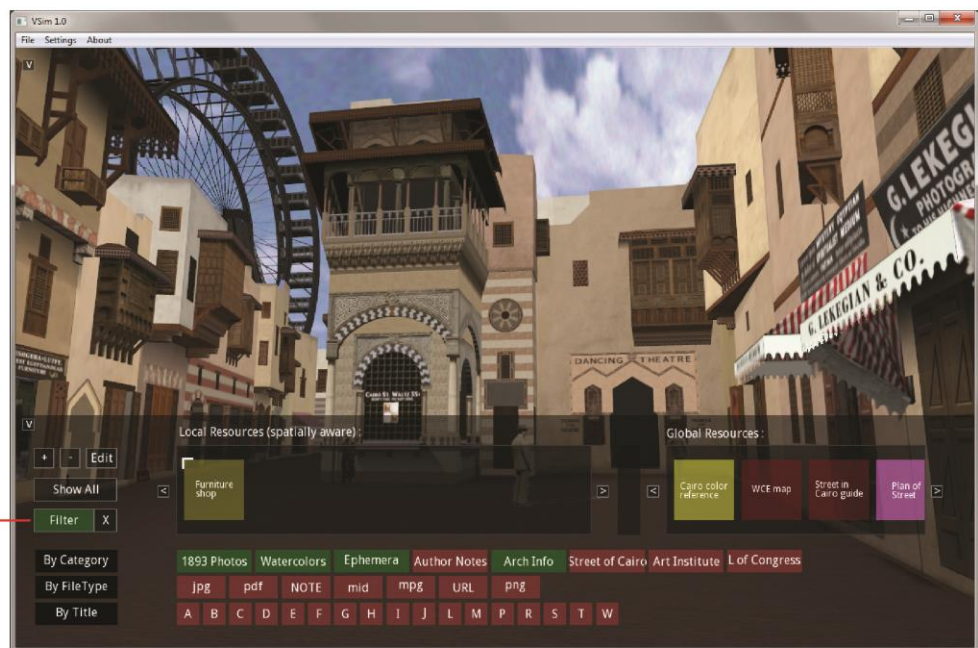
FILTERING RESOURCES

- 'Filter' allows the user to select the resources that are being displayed.
- The filtering option was created so that users could customize their experiences within the virtual world
- The background of the Filter button will show green if filtering is in place
- 'X' clears the filtering
- The filters are additive. Selecting '1893 Photos' from the example below would only display resources in that category ... selecting both '1893 Photos' and Title=M would only show resources fulfill both filters (1893 Photos where the title begins with the letter 'M')

FILTERING controls the resources displayed during interaction

Toggles display of the Filter section (if filters are on, background is green)

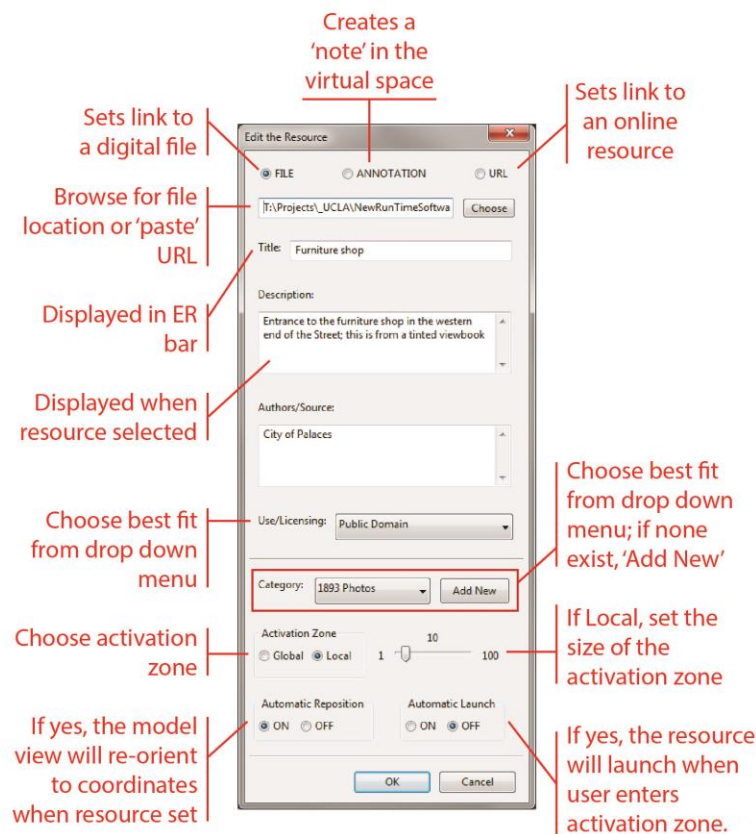
'X' clears the filters



Click resource options to be displayed during interaction

CREATING AN EMBEDDED RESOURCE FILE

- To start, gather any images that you want to use in the embedded resources into one folder on the computer you'll be using in the classroom. (The embedded resource file will save an absolute path to the image file, not a copy of the image itself; this means images have to be in a constant and accessible location so that they will show up during your presentation)
- To add an embedded resource connected to a specific location in the environment, navigate to that desired location, click the + symbol in the lower bar, and fill in the information in the pop-up window. Choose the **Local** radio button, adjust the distance slider to reduce or enlarge the resources 'sphere of influence,' and decide whether the software should reposition the user on launch.



- There is no way to mass upload groups of embedded resources. One strategy to work efficiently is to add all of your resources at once as Global resources, then 'fly' around your environment and 'Edit' the resource to adjust its settings and update its location in the virtual space.
- Global resources that don't need the user to be re-positioned on launch can be created from any place in the environment

- After editing a resource, you are given the opportunity to update its spatial information. Say 'yes' if you're repositioning the resource, say 'no' if you're just editing the metadata and the resource should stay associated with its original position.
- Export your embedded resource files to save your work. (Do this periodically just to be safe!)
- To save an embedded resource file, use the File -> Export Embedded Resources option
- Say 'NO' when it asks if you want to lock the file unless you know that you will never want to change your embedded resources ever again! (Be careful here. The default is to lock the file; this will be changed in the final release)
- Locking a file for distribution only preserves the annotations and links to URLs. This was done purposefully as a way to minimize the size of the exported .ere file. (Lots of embedded resources could generate a HUGE file ... just be mindful of the logic of the export.)
- A resource must be assigned to a category
- Consider numbering resources as you might a footnote
- Be careful combining Auto Launch and Auto Reposition ... a string of resources thus set results in a strange pinball effect as the user is sucked through the gauntlet of auto launch and reposition commands.

EXPORTING A .VSIM FILE

- Use the 'File -> Export Model' when you're ready to create files for distribution
- **Before exporting, set your model perimeters through the 'Settings -> Content Creator' menu**
- You must add information about the project for display in the 'About -> About Model' menu:
 - Model Name
 - Release Date/Version # (sorry, this is poorly titled ... use this field for the copyright date of the model, the span of the project, a release version number or similar)
 - Project Date (also poorly titled ... is really the date the file is being generated)
 - Primary Author(s)
 - Contributors
 - Place of Publication
 - Access Information/URL
- You can add a Branding Overlay if desired (like a project logo or text). Logos placed near the top of the screen with raise and lower with the narrative bar; at the bottom with the embedded resources; avoid the left side of the screen where embedded resource descriptions display
- Choose your Collision Detect and Narrative Loop settings
- Decide if you want the narrative and embedded resource bars open or closed on launch
- You can set an appropriate starting view (will show on launch)
- Sorry, the screen resolution bit doesn't work
- **Before exporting, you may also want to adjust the navigation settings through the 'Settings -> Navigation Settings' menu**
- The navigation settings are described on the next page. Of greatest importance for exports are the Eye Height, Near/Far Clip, and Acceleration Factor

Restrictions and Locking

- Restrictions and locking capabilities were included to provide content creators control over the secondary use of their intellectual property
- On export, VSim gives four options for restricting secondary use of the model:
 - 'Lock content creator settings' disables editing of the content creator settings described above. Most importantly, it locks the 'About Model' information, the Branding element, and the simulation window size.
 - 'Restrict to current narratives and embedded resources' restricts secondary users to interactions with narratives and embedded resources that were packaged with the model. (I.e., it restricts free flight)
 - 'Restrict image and video output' disables the Image Maker and Movie Maker (only applicable in VSim 1.1)
 - 'Set an expiration date for the model' controls the life of the exported file (not tested at the time of this writing)
- Any narratives loaded at the time of the export are included in the .vsim file and locked (READ ONLY)
- Any annotations and URLs in the embedded resource section at the time of the export are included in the .vsim file and locked (READ ONLY)

ADDITIONAL GENERAL CONTROLS (THESE WORK IN ALL NAVIGATION MODES)

W (shift w) - toggles between solid, wireframe, and vertex point cloud

X (shift x) - toggle textures on/off

S (shift s) – toggles through various rendering statistics (number vertices, frame rate, etc.)

- and + adjust the LOD Scale (NOTE this shows more or less detail in the frame, but the command to show less doesn't work at the moment)

c – turns on and off collision detect, and takes screenshots (places in the same folder as VSim.exe)

h - help menu (NOTE not all buttons work as listed)

Z (shift z) hit twice in succession seems to reset the model to show its full extent

PATH/IMAGE SEQUENCE RECORDING (work in progress; this will change in final version)

C (shift c) - toggle continuous screen capture on/off (NOTE this generates a sequence of images that can be assembled into a video clip; press C to begin the capture and C again to end it; the individual images in the sequence save in the same folder as VSim.exe; this feature can be used during free flight or with a narrative)

MENU OPTIONS

Collision (via Navigation Settings)

- Note that you can have the settings GUI open while flying, so hitting 'c' in the navigation window will automatically update the settings GUI

Eye Height (via Navigation Settings)

- Restriction: > 0

- Currently set at 1.5, which works with models built in meters

- Adjust for models built with different units (e.g., 60 for GoogleEarth 3D Warehouse models)

Near Clip (via Navigation Settings)

- Currently set at 1

- Change to lower number (.1) if you're clipping geometry during interaction

- Restriction: > 0

Far Clip (via Navigation Settings)

- Restriction: > Near Clip (forced to be at least +0.1)

FOV (via Navigation Settings)

- Restriction: 10 < Angle < 120 degrees

Acceleration Factor (via Navigation Settings)

-Restriction: > 0

-Currently set at 6, which works with models built in meters

-Adjust for models built with different units (e.g., 160 for GoogleEarth 3D Warehouse models)