X3D Graphics for Advanced Modeling

Chapter #

Historical and Architectural Model Creation for Cultural Heritage

Those who cannot learn from history are doomed to repeat it.

- George Santayana
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- Choice of units, conversion of data
- Grid, other widgets in X3D-Edit
- Modeling Roman Coliseum, discovering errors in historical record
Motivation and Design Concepts
What is Your Motivation?

It is helpful to consider why you are interested in modeling a historic site

Possible motivating reasons include

• 1
• 2
Historical Modeling

• Maintaining official records
• Exploring evolution over time
• Exploring alternatives when actual facts are unclear
• Provide 3D physical context to real-world events
Cultural Heritage

Wikipedia definition:

• Cultural heritage is the legacy of physical artifacts (cultural property) and intangible attributes of a group or society that are inherited from past generations, maintained in the present and bestowed for the benefit of future generations.

• Cultural heritage includes tangible culture (such as buildings, monuments, landscapes, books, works of art, and artifacts), intangible culture (such as folklore, traditions, language, and knowledge), and natural heritage (including culturally-significant landscapes, and biodiversity).
Goals and Outcomes

In order to succeed, must first answer the question “What does success look like?”

• Answers will vary depending on different users, so you must identify them and their respective goals
• Answers also vary depending on how they use the model, since that affects construction, cross-linking and deployment of the results
• Sometimes called “begin with the end in mind”

Thus the author must

• Define design goals (hopefully measurable)
• Define use cases and illustrative examples
Define Design Goals

Tour of building features, outside and inside

- Visitors want overview and ability to explore
- Regular real-world users need more detail
- Historic archiving is most thorough

Cross-reference with multimedia information

- HTML pages with descriptive text
- Photographic closeups and special events
- Audio descriptions
- Naming, indexing and metadata are important
Define Use Cases

Users

• Students of cultural heritage
• General public interested in learning more
• Archival history
• Documenting architectural restoration

Modes of usage

• Web: online interactive site
• Application: download, CD/DVD or installed media
• Electronic book
What Examples Illustrate Use Cases?
Capturing Information
Capturing Information

Be methodical and thorough

- Historical descriptions and records
- Photographs
- Illustrations
- Architectural drawings and floor plans
- Measurements (ultrasonic scanner, laser level)
- Laser and point-cloud techniques
  - Edf use cases: reactor cooling tower and diesel generator

Keeping track of it all

- Helpful to have version control and draft website available in advance: everything has a place to go, and information architecture evolves in tandem
Building X3D Architectural Models
Example Site Modeling
Example Site Construction
“Better is enemy of good enough”

- Perfect modeling is difficult
- Real world is not perfect or perpendicular
- Pictures can be taken to emphasize aspects of interest and hide flaws or imperfections
- 3D models have both good parts and difficult parts to capture
- Authors must decide on tradeoffs
  - Design goals and use cases help
- This matches historical analysis: how to make sense of partial information, contradiction, alternatives, evolution, etc.
Deployment
Deployment

- Production of distributable assets
- Version control for evolved creation
- Build tasks for repeatable deployment
- Archival methods
- Long-Term Stability, maintenance over time
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by Don Brutzman and Leonard Daly, Morgan Kaufmann Publishers, April 2007, 468 pages.

• Chapter 3, Grouping Nodes
• http://x3dGraphics.com
• http://x3dgraphics.com/examples/X3dForWebAuthors

X3D Resources

• http://www.web3d.org/x3d/content/examples/X3dResources.html
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X3D Graphics Specification
  • http://www.web3d.org/x3d/specifications
  • Also available as help pages within X3D-Edit
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Contact

Don Brutzman

brutzman@nps.edu

http://web.nps.navy.mil/~brutzman

Code USW/Br, Naval Postgraduate School
Monterey California 93943-5000 USA
1.831.656.2149 voice
1.831.656.7599 fax
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George Santayana (16 December 1863 in Madrid, Spain – 26 September 1952 in Rome, Italy), was a philosopher, essayist poet and novelist.

http://en.wikiquote.org/wiki/George_Santayana
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Navy saying: if the minimum (acceptable criterion) wasn't good enough, it wouldn't be the minimum... (this saying is more popular with students than with faculty...)

Perhaps we are glimpsing a pattern of common characteristics here between historical studies and virtual environment construction: both fields have the potential to be the “study of everything...”
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Contact

Don Brutzman
brutzman@nps.edu

http://web.nps.navy.mil/~brutzman

Code USW/Br, Naval Postgraduate School
Monterey California 93943-5000 USA
1.831.656.2149 voice
1.831.656.7599 fax
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