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HANNAH

RE- FORBES

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Beginning wire structure of a
3D rendering

What does it mean to represent something? Representation allows people to get the point of something across without the actual object being present. A 3D rendering is the best way to get an accurate visual representation of any object. This form of representation allows viewers to understand the subject much more clearly. Bringing these renderings into physical being is not always necessary but sometimes very much desired by clients or other people involved in a design concept.

“3D rendering is a computerized process of converting the 3D models into displayable 2D models. This process is the gateway of bringing your imagination into reality, without having to invest large amounts on physical resources.”(- Source #1)

“3D rendering is actively used to design virtual worlds and architectural models. 3D architectural renderings have been used by many professionals for creating lavish interior designs, without having to invest on physical resources. With 3D Architectural Rendering, one can create excellent floor designs and room maps. One can even walkthrough the designs and feel the reality of artifacts and interiors.”(Source #1)



Architectural rendering

to make a rendering of an idea for something that does not yet exist.

Cartography and Architecture

Two fields that perfectly exhibit my two categories of representation are architecture and cartography. Cartography is map making – the representation of geographical data which is already in existence and tangible. This type of representation seems to be more practical in learning and understanding. Architecture takes a more creative side of visual representation. An architectural 3D rendering allows an artist to bring his idea’s existence into other people’s reach. It makes his design accessible and tangible to others and also more tangible to himself.

My Rendering Experience

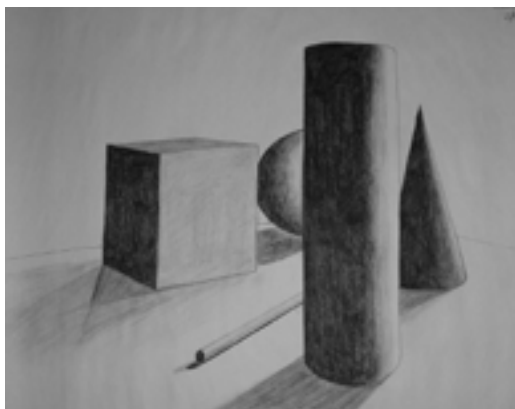
In my “Blue Rabbit” project of the “Making Meaning Matter” class, I was asked “In a world full of so much stuff, what idea is worth making

more stuff for?” This question comes alongside the opportunity/requirement of using a 3D printer. So what is better in 3D than it is in 2D? Anything attempting to be a real-world object, and anything that attempts to portray an object. This realization guided my project towards cartography. I decided to print a 3D map of downtown Olympia. As excited as I was about making and having and using this model, I was very intimidated by the prospect of actually making it happen. I’m so bad with computers and even with basic understanding of how to use tinkercad, I had no idea what steps to take. I started by importing a geolocation to Sketchup and outlining the buildings of that image and raising them up according to their spatial relation. It was wonky and little

What To Get Across

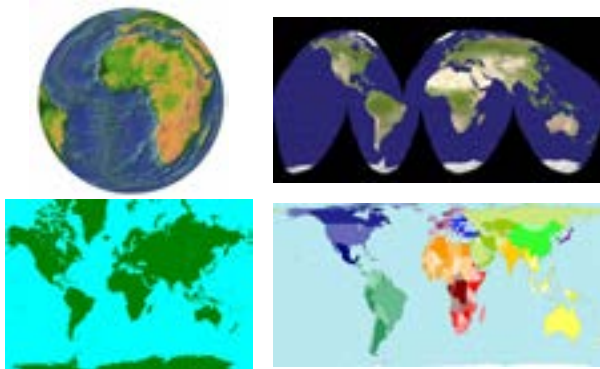
As I see it, there are two types of visual representation. One can choose to either represent an existing, real-world object, or

2D-3D



obstacles in using the software (such as not knowing how to rotate the imported image) kept my work looking hella wonky. I accepted it and kept going, but this is where I began wishing I was designing a house instead of rendering an existing city block. I kept going with my cartography theme as it still exemplified my understanding of representation, but had I had the opportunity to start over, I would have focused on architecture.

The following three iterations of my project demonstrate my story.



Earth distortion

Iteration One:

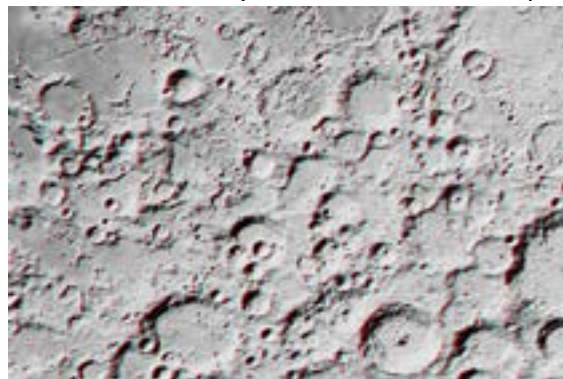
By looking at the images above, one can see that map images try their best to convey an area, but attempting to exhibit a spherical object like the earth, as a flat image is impossible to do without distortion. 3D representation of a location is the most useful and least distorted type of representation (if done properly). This is why a globe is the superior model of the earth – it essentially is a mini-earth. Of course regular 2D printed maps can be very useful in navigation, but it depends on how the map is designed, and it depends on the interpretation of the person using the map. It takes a certain type of mind to relate a flat image to one's surroundings in order to orient themselves and navigate from that.

With 3D representation, there is little to be interpreted. A tangible mass, modeling a city,

puts your mind within the buildings allowing you to understand the layout and the sensation of the area. Becoming familiar with such a model will make a person relate to the area as if they are familiar with it itself. There's little translation to be done.

Jeffrey Ambroziak is a cartographer from the United States. He is known for his invention, the "Ambroziak Infinite Perspective Projection" which is a form of 3D mapping. His development includes the third dimension of objects within images without distorting them. Distortion is a common problem among cartography since maps often try to relate 3D objects or areas to flat paper or screens. "Ambroziak doesn't consider these kinds of images to be truly 3-D, as viewers must look at them from a specific distance and angle. Glancing from the sides, or walking toward or away from the image, distorts or destroys the illusion." As a young man Ambroziak struggled to accept this distortion in maps and eventually developed a way to avoid it.

Recently he had a KickStarter project raising



3D Moon map

money to create a 3D map of the moon. He used data released by NASA to put into his program and develop the map.

"NASA put out some amazing digital elevation data of the moon late last year, but nobody had released it in true 3-D. So I decided I would," –Jeffrey Ambroziak

What is "true 3-D"?

"A three-dimensional model that displays a picture or item in a form that appears to be physically present with a designated structure.

Essentially, it allows items that appeared flat to the human eye to be displayed in a form that allows for various dimensions to be represented. These dimensions include width, depth, and height.”

The above definition of “true 3-D” says that for something to be 3D it has to display something in a form that “appears” physically present. I want to make something that actually is physically present. It will be exactly what it is showing people. There will be no possibility of distortion anywhere because its appearance does not depend on its viewers.

Unlike the idea for my project, Ambroziak’s map is 3D in the sense that a 3D movie is. He refers to it as “true 3D” because one can move with the image without distorting it. However, they still need 3D glasses and they cannot touch and feel the dimensions. This is why I aspire to create a map or model that is a tangible 3D representation of Downtown Olympia.

3D images are definitely getting popular these days. As someone who has an affinity for cartography, I truly appreciate maps that include the third dimension.

Digital representation can be great. It can document and enhance scenes. I think a digital version of this 3D rendering of Olympia would maybe be more practical. It could be used as an app on a cell phone to be pulled up and used anytime. Especially if the rendering is very realistic and can be moved around in all different angles, it would be just as useful as the physical version, most likely. But I think that it is worth bringing this idea into physical existence because there’s something about being able to touch and move what you’re looking at. I believe people would be more interested in viewing the model for a decent amount of time if it was a physically present model. It wouldn’t necessarily be more useful, and definitely not more practical than the digital version, but I believe it would be more enjoyable and exciting.

Iteration Two:

“Seeing is Believing”

How do 3D printed models or maps enhance representation?

I believe that 3D representation gets the point of physical objects across best, which is why studying a map that is 3D printed and physically present can help one understand an area better than a flat map image. I came to this idea because the concepts of representation and perspective have always been interesting to me throughout my life. I’m someone who always likes to see things from different angles and I try to contemplate how ideas or data might be better represented and therefore better understood. I’m excited to make a 3D model of at least part of downtown Olympia. Even if I’m the only viewer of it, I know it will better my understanding of the area.

In doing research for this project, I struggled to find sources (that were accessible and understandable to me), which pertained exactly to my idea. It surprised me that it was so difficult to find cartographers interested in 3D mapping, since distortion is such a huge part of 2D mapping. Instead I found examples of my idea demonstrated in Architecture and models of building designs. I came across pages for different companies explaining how 3D printing or 3D rendering/modeling has made a huge difference on the way they do business. Rietveld Architecture Firm perfectly describes why 3D rendering is important for clients’ understanding of designs, and also how 3D printing their designs allows for many more models of various scales and iterations to be made more quickly and efficiently. 3D printing these necessary models also allows for more detail to be incorporated, which provides easier understanding for the viewers.

“During the course of a typical project, Rietveld, like other architecture firms, builds numerous models in increasing detail and scale that help clients to visualize designs. And, like other firms, they had traditionally built these models by hand – a task that usually

required two employees to spend upwards of two months cutting, assembling and finishing components made of cardboard, foam board and Plexiglass. The time and expense to hand craft these complex elements dictated that the models have an inadequate amount of detail, limiting the creativity and therefore showcasing a model that sometimes did not sufficiently highlight the selling points of the design.” (Meijs).

Rietveld Architects have been able to take their business a step ahead of their competitors. They say there is always a “wow factor” when they present a 3D printed model. Obviously models are necessary in the architecture industry, in order to examine and appreciate designs. Now 3D printing has brought ease to this very important piece of every project.

Brian Smith and Brian Zajac, founders of 3D Architectural Solutions, are firm believers in the 3D movement and development of the field. They both individually began working on 3D studies in the 90s. While Smith steadily progressed in the field of 3D, Zajac moved to web design, under the impression that work in 3D was not quite worthwhile in those years. Later on he noticed that the world of 3D was quickly picking up actually cost effective (unlike in the 90s) and at this point he and Smith joined to form 3D Architectural Solutions. In 2006 they teamed up with other organizations to form CGschool, which is now the leading company in visualization training.

It is clear that both of these men are very wisely invested in the field of 3D representation. This interest pointed them both in the direction of architecture. The field of architecture is perfect for utilizing expertise in 3D representation,

as I talked about before. 3D representation is used for presenting a design most accurately. It is useful to both the designers, and the clients. It is the best way to understand the data in front of you.

“3D Rendering has brought about huge efficiencies in the architectural and engineering industries in recent times. 3D rendering is the



Olympia after midnight

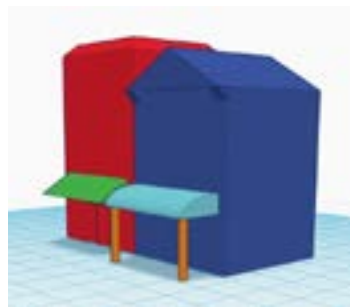


City block by the park

process of producing an image based on three-dimensional data stored within a computer.” (The Benefits).

The data used to create these images was already being

generated with every design created, but until 3D rendering became a big part of the industry, the only way to understand the design was either by interpreting numerous 2D drawings, depicting different angles, or to use a model which was an expensive, time consuming, detail limiting piece of work... before 3D printing came into the scene.



Building model development in tinkercad

Representation is key to understanding. In the fields of architecture, mapping, engineering, and others, it is important that people be able to convey their designs, or data they have collected in a manner that makes sense. With anything that exists in three dimensions, the most sensible representation is 3D rendering which is now more than possible but very efficient. I’m excited to create my very own model of the city that is my new home.

Iteration Three:

How can someone experience Olympia even

without being there?

Olympia is a beautiful city. Unfortunately, it is nearly impossible to see that from an aerial view or a map. To experience the beauty and to feel the vibes of the city it is important to be within it—to be able to



A 3D printed city model (since mine doesn't exist yet)[14]

view surroundings from many different angles. Capturing Olympia's essence in photography is a step in the right direction, but imagine viewing the city by means of a 3D physical model. It would be like a miniature Olympia that you can hold in your hands or set up on your desk.

Skill Is Important

I believe that 3D rendering programs are amazing and essential tools in representing physical concepts and data. Over my 10 weeks in the Making Meaning Matter class, I learned how essential tool using skills are to anyone who wants to bring an idea outside of just their mind. Representation is very difficult and almost useless without proper rendering skills, regardless of what you're trying to represent. Having these skills allows for better aesthetics and better accuracy, therefore necessary to getting a full idea across.



Skill sharing [15]

1. See: <http://www.cgmentor.com/design/what-is-a-3d-rendering.html/>, accessed 7 December 2014, posted 2 October 2013
2. Ambroziak, Jeffery R. "PopView 3D Moon Map." Kickstarter. Kickstarter Inc., 2012. Web. 19 Oct. 2014.
3. Dilger, Daniel E. "Apple's IOS 7 3D Maps Leave Google Earth, Nokia Maps 3D Looking Old Fashioned." Apple Insider. Quiller Media Inc., 30 July 2013. Web. 19 Oct. 2014.
4. Mosher, Dave. "Stunning New 3-D Moon Map Made From Lunar Data | WIRED." Wired.com. Conde Nast Digital, 08 Feb. 0012. Web. 14 Oct. 2014.
5. "What Is 3D Representation? Definition and Meaning." BusinessDictionary.com. Web Finance Inc., n.d. Web. 17 Oct. 2014.
6. "Yale Bulletin and Calendar – News." Yale Bulletin and Calendar – News. N.p., 21 Jan. 2000. Web. 19 Oct. 2014.
7. "3D Modelization and Visualization." Open Text. Open Text Corporation, 2011. Web. 02 Nov. 2014.
8. "The Benefits of 3D Rendering." AAB-Sys. AABSyS IT, 2014. Web. 02 Nov. 2014.
9. "Benefits of 3D Rendering and Visualization." GIS Virtual RSS. GIS Virtual, 08 Aug. 2012. Web. 02 Nov. 2014.
10. Meijs, Piet. "Examples of 3D Printing in the Architecture Industry." 3D Printer. Javelin Technologies Inc., 2014. Web. 02 Nov. 2014.
11. Meijs, Piet. "Objet Technology Enables Architecture Firm to Shave Months Off Model-Building Time." Case Study. Rietveld Architects LLP, 2010. Web. 2 Nov. 2014.
12. Smith, Brian, and Brian Zajac. "Why Are 3D Visualization Renderings and Animations Important?" 3D Architectural Solutions. 3DAS LLC, n.d. Web. 01 Nov. 2014.
13. "The Societal Impacts of 3D Printing." 3D Printing. WordPress.com, n.d. Web. 02 Nov. 2014.
14. See: <http://cucfablab.org/sites/cucfablab.org/files/images/Alecville%20Minecraft%20city%203D%20printed.JPG>, accessed 3 December 2014
15. See: <http://blogs.nature.com/nature-jobs/files/2012/10/New-Image4.jpg>, accessed 3 December 2014