PROJECTION MAPPING EXAMPLES

Version 1.0 last updated 17 October 2018

|  |  |
| --- | --- |
| Complexity | 7 |
| Updatability | 2 |
| Sustainability/Maintenance | 7 |
| Accessibility | 6 |
| Interactivity potential | 4 |
| Passive – active | 3 |
| Immersiveness | 9 |
| Reusability index | 3 |

|  |
| --- |
| What is it? |
| Projection Mapping involves the orientation of projected visual content to 3D physical objects or structures to produce striking and transformative visual effects.    It is achieved through the specialised creation of content to be mapped onto a particular object or structure from a projector installed in a fixed position, and for an audience to view from an ideal point, location, or area.    Objects and structures used for Projection Mapping can include:   * Collection objects or replicas * Everyday objects, such as a car or a shoe * Moulded or 3D printed objects or structures * ‘Blank’ forms such as geometric shapes, mannequins, organic forms, or 3D lettering * Kinetic forms or sculptures * Robotic mannequins, or animatronic forms * Building facades * Human bodies or faces <https://vimeo.com/149727840> <https://vimeo.com/149727840>   Visual content used in Projection Mapping can include:   * Animations * Still graphics * Text * Motion graphic content that can have the appearance of fine lighting effects, such as edge lighting or contour lines on an object or form * Photography and live-action film, with constraints |
| What is it not? |
| * Projection Mapping is not simply use of a projector to display content on an unusual surface * Projection Mapping is not simply large scale projection on a building * Projection Mapping rarely accommodates unmodified pre-existing content * Projection Mapping is not a particular piece of technology, hardware, or software, but rather, is achieved through a set of techniques and tools * Projection Mapping is not a laser light effect * Projection Mapping is not a gobo ‘stencil’ lighting effect |
| What is it good at? |
| Projection Mapping is most famous as a technique for transforming the appearance of building from being monolithic and solid, into something articulating, fluid, and dynamic.    Projection Mapping has rich storytelling potential. Not only can this technique be used to captivate audiences through magical visual effects alone, it is a medium well suited to narrative delivery.    Combined with other techniques, such as kinetic sculpture (Melbourne Museum First People creation story), motion capture (dancers within a grid example), or Data Visualisation (e.g. Te Papa’s Gallipoli Maps) Projection Mapping can be used to produce high-impact memorable, immersive, transformative experiences for large audiences.    On smaller scales, more subtle techniques can be used to augment visitor experiences of collection objects or gallery environments. This can be achieved by mapping text elements, imagery, or visual information onto or around collection objects, where light levels will not impact on care of collection objects. |
| What is it not good at? |
| A high degree of environmental control is required   * Ambient lighting must be controlled * Audience positioning is critical * Limitations on updating and re-use of content, as content must be produced to be mapped onto specific objects. * Content is not easily able to be modified or updated * Higher-level hardware purchase and maintenance costs * Projection hardware is usually more expensive than other forms of digital display and have higher maintenance costs * High-powered projectors required for larger scale object/structures, have even higher purchase and maintenance costs * Higher-level set-up and install cost * Build tolerances are extremely low * There are more constraints on how photographs or live-action video can be mapped effectively. Animated graphics are much more versatile. |
| Related technologies/Neighbours |
| Dome projection (Planetariums) and Sphere projection (Science on a Sphere) – can be seen as a form of projection mapping, where the imagery is always created for projection onto a regular curved surface.    Large scale projection – where buildings are projected on using content that has been created without projection mapping techniques. |
| Environment and install considerations |
| Projection Mapping has a high level of environmental constraints:   * Control of ambient light levels is vital * Control of audience positioning is vital (both in terms of distance from the object/structure and the viewing angle) * Control of the position of the projectors and the object/structure     However, the degree of control over the position of the audience is dependent on the scale of set-up. At larger scales, more people can be accommodated within the optimum viewpoint. (See diagram).    The size of the object or structure that can be mapped onto is limited by the power of the projectors available, and the ability to position the projectors and audiences at optimum locations in relation to the object/structure. |
| Resourcing/skills required |
| * Object scanning * 3D modelling * Texture mapping * Animation (2D and/or 3D) * Motion graphics * Sound design / recording / engineering – as there is often an accompanying soundscape for more theatrical experiences * 3D printing * Moulding/sculpting * Spatial design/construction * AV tech design and install |
| Hardware required |
| * A projector, or projectors, are required * 3D scanning equipment is required within the production phase * 3D modelling tools, such as Unity, or 3D max * A number of tools are available for various steps within the production and install process. Projection Mapping Central includes a good community database of tools:<http://projection-mapping.org/tools/> |
| Scoring out of 10 |
| **Complexity 7/10**  Could be higher than 7, depending on what you are projecting on (how uneven), whether there is audio in the environment or not etc. |
| **Updatability: 2/10 on an updatability scale**  Not readily updatable due to the fixed relationship between the content and the object |
| **Maintenance/Sustainability (how easy it to sustain and maintain): 7**  It is only really the digital assets that need maintaining |
| **Accessibility: 6** |
| **Immersiveness:9/10**  Projection mapping can be used to gain very high level of immersiveness, completely transforming an environment in fluid and dynamic ways. |
| **Reusability index: 3 on a reusability scale**  Broadly speaking, Projection Mapping content is not reusable. However, the techniques, skills, and tools used to produce a Projection Mapping product are reusable.  The digital files can be re-used in other platforms, such as on the web |
| Examples |
| **Projection mapping illumination onto real-world natural environment**  <http://www.thisiscolossal.com/2015/01/a-bioluminescent-forest-created-with-digital-projection-mapping/>  Technique could be used for e.g. ants moving across a complex surface of a log; possibly fireflies; a spider moving across surfaces, larger than life, or life-size;      **Interactive projection mapping**  Maybe used to show Spiders, ants etc. responding to your gestures and crawl onto your hand. Notice the highly pixelated quality – this is what happens when you get up close to a medium-large projection. One way to increase the resolution is to use a number of small, short-throw projectors, rather than one or two sitting at distance (i.e. directly overhead):    <http://www.squidsoup.org/blog/category/projection-mapping/>    **Transformative projection mapping**  The structure and appearance of a physical object transforms before your eyes: Maybe used to see inside an insect, or Show the process of metamorphosis, beginning with caterpillar form.      <https://www.youtube.com/watch?v=vB3XSBw7ygw&feature=player_embedded>  <https://vimeo.com/15749093>    **Line drawing, pattern projections**  This could be a way to create an abstract environment based on bug textures or tech materials:    <https://vimeo.com/32756536>  Making of: <https://vimeo.com/48285842>  And this one:  <https://vimeo.com/46857169>    **Floating light effect:**  This one is just quite cool, it has extremely well done firefly-like flying spark at the beginning which is excellent, but I think because it uses flat surfaces, it would require the viewer be in one fixed location for the full effect. Using a dome surface without 3D objects greatly widens the ‘sweet spot’ for viewing:    <https://vimeo.com/56269574>    **Projection mapping on an object within a case:**  This one shows an interesting concept for projection within a case. The actual example is not great, but interesting to think about projection onto an object within a case:    <https://vimeo.com/100462668>    **Projection mapping of live bug footage**  An interesting technique for filming live bugs then projection mapping them onto a building: Maybe a pre or post experience? It’s pretty full on!    <https://vimeo.com/37176398>    **Miniature projection mapping**: Asking people to come in close and ‘look closely at what’s happening down there –Oh! It’s a spider!’ Or: ‘Oh! Its beautiful – John – come and see – look you look in under here…’    <http://projection-mapping.org/the-ice-book/> |