ANZAGG 3D Meeting Minutes

Wednesday 15 December 2021

# 1. Roll call

Meeting chaired by Leona Holloway, Monash University.

9 attendees from NextSense, SPEVI, Monash University, Victorian Department of Education, NSW Department of Education, Mountain Lakes Public Library, NNELS

# 2. Icebreaker - What have you been designing/printing in the last month?

## 3D modelling maps

Request for a tactile map. They tried TouchMapper but it didn’t have the buildings. Instead, they used a picture of the map, traced in Inkscape, then built up in TinkerCAD. Each layer needed to be imported as a different file so they could be extracted to a different height. Is there is an easier way?  
Two members have used Sketchup to trace directly in the 3D printing software then extrude upwards. Another member has done the same thing with Fusion 360.   
Sometimes it works to automatically convert to SVG in Illustrator. Use image trace, then fix the paths and import into Fusion360. Each path is a different layer/body. Slicer for Fusion 360 is a free plugin that works backwards to create layers.   
Fusion 360 is still free for non-commercial use. It is HIGHLY recommended, as it is powerful but not too tricky to learn if you have already been using something like TinkerCAD.

## Accessibility of modelling software

However, Fusion 360 and most other CAD software are is not VI accessible. A member has been using OpenSCAD and sending to tactile graphics embosser to check the output, although this is not always successful. Some computer design could surely be done with audio cues. Audio games complex environments can be sonified; 3D modelling should be done this way too.

Researchers from the [Smith-Kettlewell Eye Research Institute](https://www.ski.org/) are working on a mapping application using audio cues, e.g. footsteps, reverb, bird sounds, etc.

Multi-modal models with touch points for audio would be more engaging.

Trying out different slicers for accessibility. Prusa isn’t good for orienting the model. Slic3R seems to be pretty good.

## Accessible Graphics for leisure purposes

A member is looking at making fantasy maps. There are a lot of educational materials available for touch readers but not things for adults and for leisure. It is important to support enjoyment using tactile graphics. [Touching The News](https://lighthouse-sf.org/ttn/) is a good step, with weekly tactile graphics relating to current news, voted on by touch readers.

A member has been printing tactile graphics for popular characters like Rugrats and South Park.

Another member suggested using [Dungeon Scrawl](https://probabletrain.itch.io/dungeon-scrawl), which was designed for generating diagrams for dungeons and dragons maps but can also be used for other types of maps. It includes icons that can be placed on the maps.

# 3. Draft Guidelines

Published guidelines: <http://printdisability.org/about-us/accessible-graphics/3d-printing/>

ACTION: Leona to add suggestions from this meeting to the relevant existing and draft guidelines.

Draft guidelines have been written on other methods to create 3D models, but have not yet been released.

# 4. Discussion topic: Using other methods to create 3D models

## Ceramics

Is production of ceramics practical for most people? A lot of schools have kilns and a knowledgeable art teacher.

## Moulding and casting

A member tried moulding and casting but found it quite fiddly. They started with a $100 kit and some resin, but skills are required.

Another member agreed that it can be quite finicky. If using chemicals like resin or silicone it needs to be done in a well-ventilated area. Models that sit on a flat surface are easier because you can place the object in the mould rather than trying to suspend it and create a two-part mould.

Another member has used the Z-cut method on a silicone mould for a suspended model, as shown in a photograph in the guidelines.

Should we be seeking advice from industrial design centres that are experts in these processes? It was agreed that this is a topic worth exploring further, with invited guests who are experts in the various methods.

## Thermoform

A member is planning to try thermoforming 3D prints.

There are a lot more options for thermoform machines now. There are lots of DIY instructionals online and you can also buy cheap desktop machines that connect to a vacuum cleaner.

It also depends on what type of thermoform sheets you use – the standard braille sheets are not rigid enough for 3D forms but there are many other types available. A member recommends HIPS 0.5mm plastic. HIPS is used commonly in the UK.

## 3D scanning

A member asked about the opposite pathway, going from a handmade model to a 3D printable design. This is covered in the guidelines. It is worth using a dedicated 3D scanner because otherwise a lot of post-processing is required for the model before it can be printed.

# 5. Other Business

## 5.1 Invisible Heritage

The Invisible Heritage Conference was held this month, organised by Bob Marek on the topic of touch access to art. International guest speakers presented via YouTube at <https://www.youtube.com/channel/UC9o7kDfBcC5PJzH5z7KPm2w>. Leona presented on 3D printing for access in art galleries and museums. Other interesting talks included Aishwarya Pillai on techniques for creating 3D painting as a blind woman, and Duncan Meerding who is a partially sighted designer from Tasmania.

## 5.2 Plans for 2022

We are happy to continue this group beyond the ARC Linkage Project. We are happy with a mix of guest speakers and open discussions.

Next year, we have tentatively booked speakers from 3D4VIP and See3D. We would also like to learn more about:

* other techniques for creating 3D models
* how to add multi-modal interactivity
* Techniques for people who are blind or have low vision to create 3D models

# 6. Next Meeting

16 February 2022

We wish everyone a very happy and restful festive season and look forward to the next year.