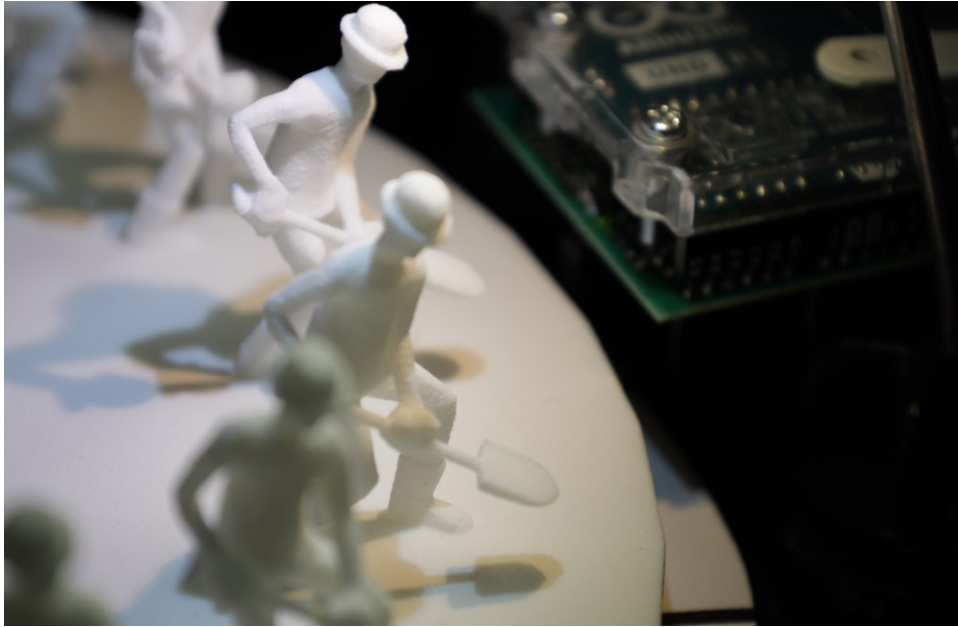# I Interactive 3D zoetrope, with manual strobe lights

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1. Seeing animation on 3D printed models

This work *Negative Homeostasis* is a 3D zoetrope made by 3D printer output. The work consists of 37 models arranged on a disk approximately 11 inches in diameter.

As with any existing zoetrope previously, the models can be rotated to animate. As the author has a background in filmmaking, she has previously produced 3D zoetrope animations that are viewed as stop-motion video, once filmed through a camera lens. However, in this work, due to a concept, the viewer spins the turntable by hand to create a stroboscopic, for the real time animated sequence under the strobe lights.

What this animation represents is a negative loop which always not too easy to break, such as unhealthy habits, addiction, or relationships that we are chained to in our everyday lives.

This model is a part of VR/MR art installation therefore was output physically to synchronize with the 3DCG in the VR space. The strobe light required for the animation was designed to be triggered by the interaction with the viewer, as it was intended to be used as an interface between the virtual 3D landscape and the real space.

2. Model Making

The Model was modeled and animated with 3D CG program Autodesk Maya. Once the animation was tested and revised in the program, the model was exported as a .stl file to 3D print. The scale was decided by the of the diameter of the turn table which made for LP records size of 12 inch. Each model turned out as short as an inch of its height due to the limitation of the final output size.

3. Output Data

Table 1: Example of Table

Dimensions	280 x 280 x 65(mm)
Printer	HP Multi Jet Fusion 積層ピッチ：0.08mm
Material	PA12（ナイロン 12）

Figure 1: Sample of a wide figure. Caption (serif font, 9pt, numbered, e.g)

4 Interactive Strobe Lights

The speed of rotation of the turn table would not constant when the turntable on which the model is placed is rotated manually by an audience. White and black markers corresponding to the arrangement of the model were used (specifically, a 12-inch disk with 20 radiation lines printed on it protruding from an 11-inch model), and an Arduino infrared sensor was used to recognize the linear markers as a pattern, causing the LED lights to blink in sync.
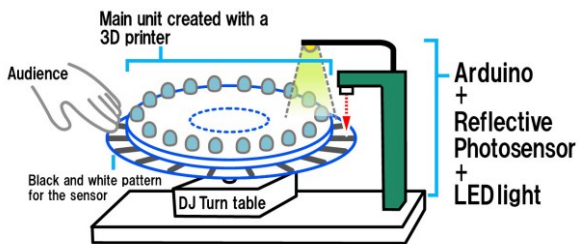

Figure 3: The strobe system

References

1] Simon Stampfer, Jonathan Blower ((Translator)) :Stroboscopic Discs: An Explanation, (2016) , Art in Translation, 8:1, 19-33
[2] Autodesk Maya, https://www.autodesk.com/
[3] Arduino https://www.arduino.cc/