

3D Print of the month.

August 2018

Lithophanes

This month's 3D print of the month isn't about a specific 3D print, but about a 3D printing technique that can be applied to all sorts of modelling situations.

Nearly all plastic lets light through to a greater or lesser extent. It is 'translucent'. Now most of the plastics used in 3D printing aren't very translucent, that is they don't let a lot of light through. But if you take a 3D printed sheet of white plastic and hold it up to a bright LED light, you will see the light through it. The more plastic that is deposited on any area, the less light will get through. So if a 'picture' were to be printed, where the darker areas had more layers of plastic, you could print a thing that looks and acts like a monochrome 'slide' that, once lit, reveals an image. Because we are 3D printing, 'this slide' can be any shape, and almost any size.



Figure 1: "I see de moon, and de moon see me . . ."



Figure 2 : Typical 3D printed flat Lithophane

Whilst so far people are using lithophanes to create lamps, lightcatchers and the like, the technique could also be used to model distant skies for the back of a diorama, realistic insides for buildings or coaches etc, even the fronts of buildings in high detail (remember a typical 3D printer has 0.05mm resolution).

For those of us who are already 3D printing, the steps in lithophany are:

- 1) Choose, take or make an appropriate image.
- 2) Use a program (there are currently about a dozen, including Cura, Simplify3D and Slic3r) to do the conversion from jpeg/png file to lithophane stl file.
- 3) Set some parameters (there is some trial and error, and results will depend on settings)
- 4) Slice the image.
- 5) Print SLOWLY using a slow print speed, fine nozzle and fine layer height.
- 6) Illuminate the lithophane.

This last point can be important. Using 3 colour LEDs (neopixels?) The colour of the lithophane can be altered, for example to alter mood. There may be room to stack multiple lithophanes of different colours and create a set of window images, for example, that change as the colour of the incident light changes.

There are lots of possible applications. If you think you might have a use for it, let myself , Davy or some of the 3D printing team know, I am sure we'd be interested in developing this emergent modelling technology.