DUNE

-- a lamp designed for massage therapy waiting rooms.

Jason Gao & Marcel Wang

Dune is a lamp designed for massage waiting rooms.
Inspired by the Japanese dry garden / zen garden, we hope to bring an experience of peace, meditation, and emptiness by praising the circular movements of shadows created through the miniature landscape lightened by dynamic LED, in order to help patients breathe and relax.

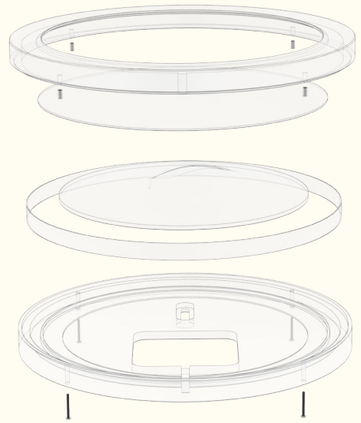
Fg.1. Lamp front view

Fg.2. Lamp close view

Our lighting design is made for the Massage Therapy Clinic. Massage achieves various balances of bodily functions by activating acupoints in different body parts to unblock the meridians, following the law of natural yin and yang balance.Considering massage therapy itself helps reduce stress and release pain, our lighting design is more focused on the decoration side of the clinic. In addition, we assume that patients who come to massage therapy clinics look for a relaxing and comfortable experience compared to patients who go to the hospital for treatment. So our goal is to create a cozy and satisfying add-on to the waiting room.

We used two rows of LED strips: the static one provides the base neutral brightness for the lamp, and the other one is animated at a certain speed to warmly lighten up the middle structure - the dune.

The dune is generated using Blender’s geometry node with Voronoi texture and get printed using transparent PET-G



Fg.3. Lamp design view

The layer-by-layer printing method of 3D printing shows the shape and texture of the dune flowing curve perfectly. The shadow created through animated LED and fluctuation is subtly changed over time. The choice of wood material was also referred to the studies that believed that visual contact with wood material positively affected the brain and autonomic nerve activity.

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Research

We noticed that in some research, natural elements are helpful for patients' mental health. The article "Preferences for photographic art among hospitalized patients with cancer" shows, "The photographs they preferred most often were lake sunset (76%), rocky river (66%), and autumn waterfall (66%). " Another paper, "Physiological Benefits of Viewing Nature: A Systematic Review of Indoor Experiments" shows "Studies that used real nature stimuli reported that visual contact with flowers, green plants, and wooden materials had positive effects on cerebral and autonomic nervous activities compared with the control. studies that used real nature stimuli reported that visual contact with flowers, green plants, and wooden materials had positive effects on cerebral and autonomic nervous activities compared with the control."

They all point out one thing - visual images of natural elements effectively bring a good mood and reaction to patients. Both of us were interested in introducing natural elements into the space. Besides, to encourage patients to observe the lighting fixture, we'd like to add some motions to draw their attention as a distraction strategy in the waiting room. Thus we started to think about combining natural elements and kinetic movements.

Fg.4. Japanese zen Garden. Image credit:Getty Images

The notion of the Japanese dry garden / zen garden (かれさんすい 枯山水) drew our interest. "枯山水 is a style of the Japanese garden. It creates a miniature stylized landscape through carefully composed arrangements of rocks, water features, moss, pruned trees, and bushes and uses gravel or sand that is raked to represent ripples in water. They were intended to imitate the essence of nature, not its actual appearance, and to serve as an aid for meditating about the true meaning of existence".

"The meaning behind the Japanese zen garden" articulate how it works and why important. We are not creating a zen garden in the hospital waiting room but hopefully, we can decorate the room with some elements that could unclutter spaces to unclutter the mind for contemplation and meditation in the chaos of our life.

Diving down the concept of the zen garden, we were fascinated by the mental peace brought by zen and the sand with beautiful patterns. White sand and gravel had long been a feature of Japanese gardens and were seen as representing purity according to the Shinto religion. Thus we chose the sand as the natural element in this piece. In terms of motion, considering that the waiting room might need a quiet environment, we chose to animate the LED strip instead of any mechanical structure like motors that make noise.

Fg.5. Sand. Image credit:Getty Images

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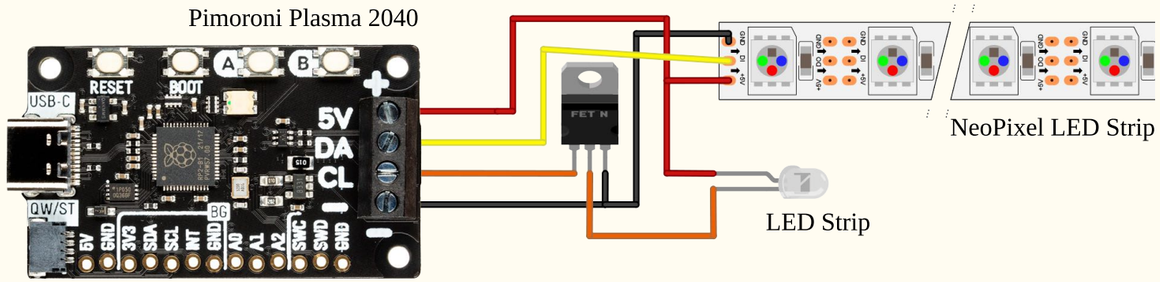
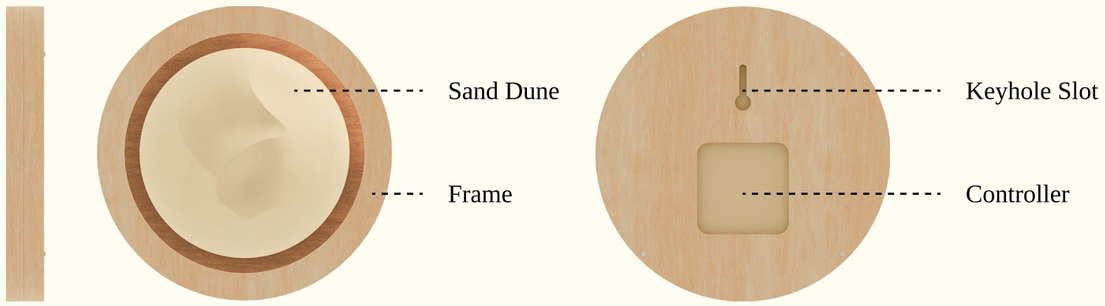
Schematic



Fg.6. Circuit

We chose the Pimoroni Plasma 2040 as the controller because it has a voltage converter and a current detection circuit. A MOSFET is added to drive the non-addressable natural white LED strip.



Fg.7. Side/Front/Back

Dimensions: 238mm x 238mm x 34mm

Power Consumption: 5V 5W

Materials

Female Threaded Round Standoff, Aluminum, 1/8" Od, 1/4" Long, 2-56 Thread Size	4
Passivated 18-8 Stainless Steel Pan Head Phillips Screw, 2-56 Thread, 3/4" Long	4
Pimoroni Plasma 2040: controller for WS2812/Neopixel addressable LED strip	1
Adafruit Mini Skinny NeoPixel LED Strip - Warm White 3000K - 60 LEDs/m - 1m	1
MOSFET N-CH 100V 14A TO220AB	1
COB 640LEDs 1200lm Dimmable 5V USB LED Strip White 4000K	1
Raspberry Pi 4 Power Supply USB-C 5.1V 3A	1
1 in. x 12 in. x Random Length S4S Oak Board	2
3 mm (1/8) x 12 x 12 Craft Plywood	1
Cricut® Walnut Natural Wood Veneer	1
Flexible Translucent PE Plastic Sheet 48x24x1/30 (0.03)	1
Clear Colorless Acrylic Sheet 12" x 12" x 1/16" Thickness	1

Resources

Code & 3D Models

Bill of Materials

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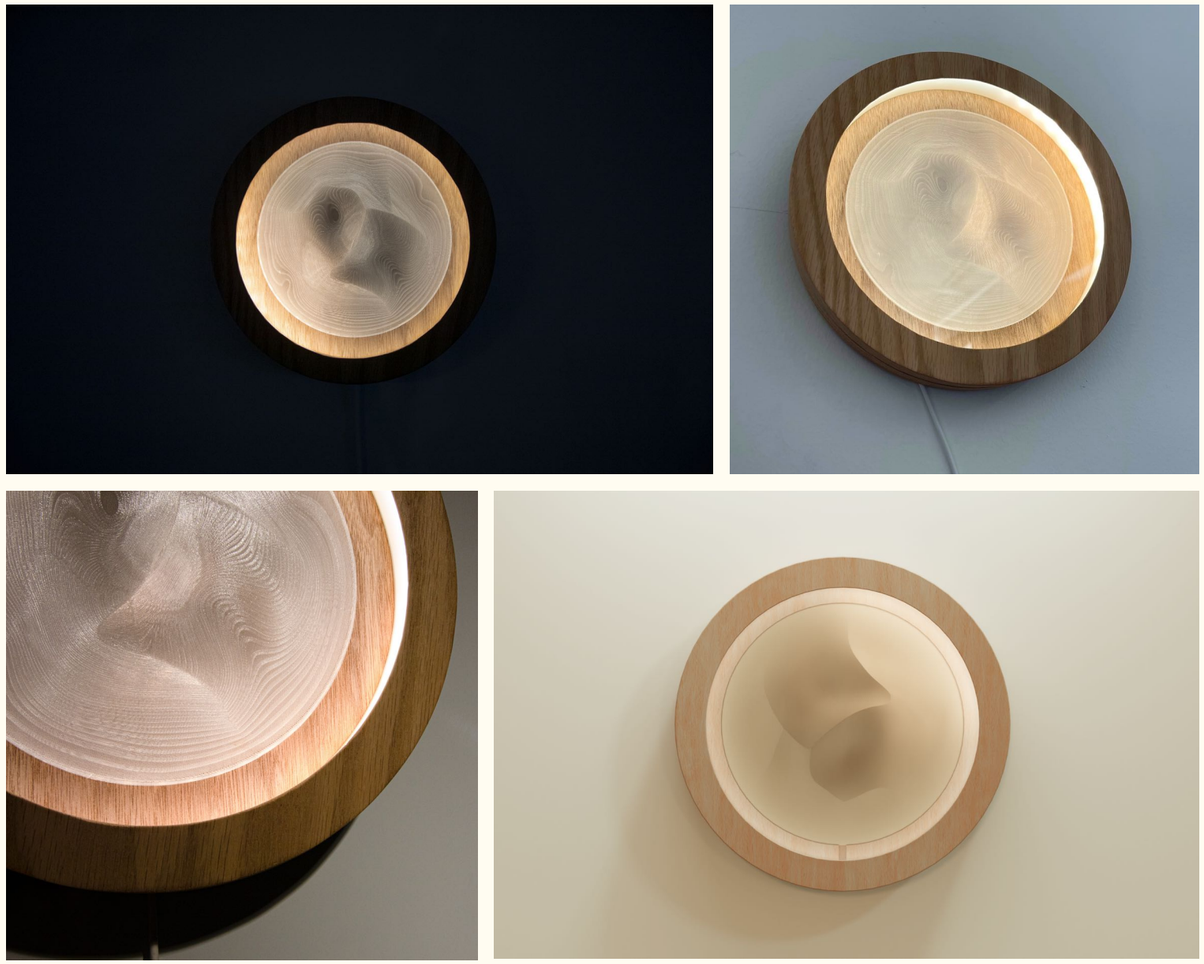
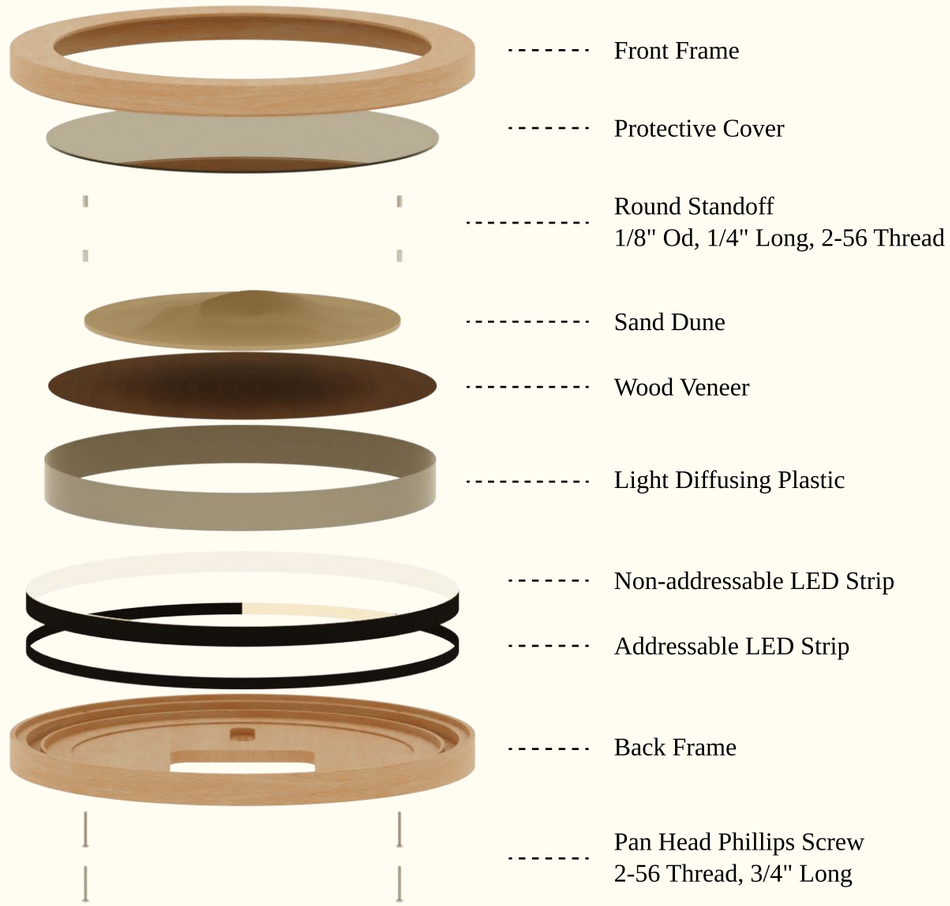
Video



Fg.8-11. Lamp images



Fg.12. Exploded view