Paint Mix by Vibration

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Image/Video 2

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I. Image Context

For the second image-video assignment, I wanted to play with mixing paint. I was inspired by my classmates and the stunning paint swirls featured in some of their pictures. However, I wanted to take a different, more untraditional route to mix the paint.

The second aspect of my inspiration is my work. I am currently doing vibration test design so while I was looking into it I had the idea to incorporate vibration into my image. This lead to me playing intense bass on my speaker and then putting a tupperware of water on top of it. Figure 1 shows the raw resulting image.

Figure 1. Raw image of paint pour.

II. Fluid Dynamics

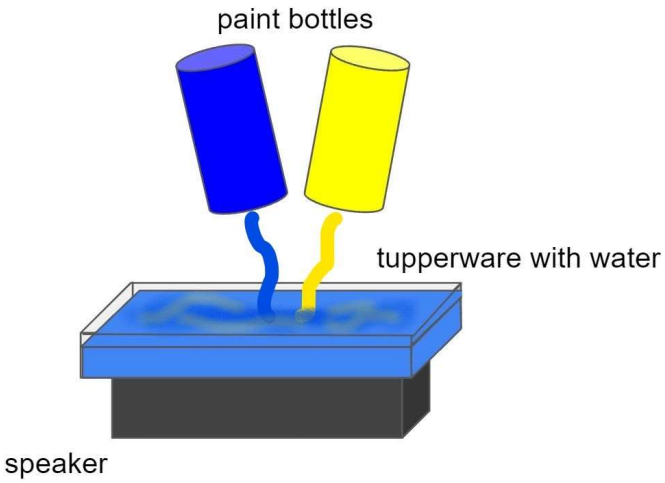

Figure 2. Flow apparatus of the paint pour.

The flow apparatus used for this image is shown in Figure 2. As mentioned in the context, I had a tupperware of water on top of a speaker playing a song with repetitive heavy bass. I poured the paint in as I played the song and let it mix naturally.

The sensation I noticed most was the surface tension of the paint. As I poured it in, it took the shape of a worm until there was enough vibration to mix it in. I used water-based acrylic paint, which is inherently more dense than water. The differences in densities cause the two fluids to not mix together immediately.

$$Q = E_{therm} - E_{therm} \quad \text{Eq. 1}$$

$$E_{therm} = mcT \quad \text{Eq. 2}$$

I also was pouring warm paint into cold water, making a temperature gradient apparent. Assuming an isolated environment, the thermal energy in and out are equal at steady state [1] (Eq 1.). So once the paint is in it is cooling as the water is warming, thus mixing together.

III. Visualization Technique

To visualize the paint mixing I shot the photos from directly above. Additionally, part of my visualization technique was having the paint vibrate together. I used blue and yellow because I felt they made a nice visual contrast, clearly showing the swirls. I also used water to put in in since the fluid is clear but also moves easily with a force imposed on it. I used lighting that cast the least amount of glare onto the water.

IV. Photographic Technique

The field of view for my image was about 6.67 x 4.41 in. I decided on this field because it was the best focus of the image I could get given the light I was working with. I held the camera about 5 in away from the tub of water. My camera lens focal length is 18-55mm and I use a Nikon digital camera D5500. The original photo was taken with the pixels 6000x4000. The camera was on ISO setting A 3000. The aperture was on F/ 4. The shutter speed was 1/60. These are the same settings as my first image from the semester because it worked well for me the first time.

Figure 3 shows a comparison of the raw and edited images. In my editing, I cropped it down to where it was just the paint. I then upped the saturation, exposure, and contrast. I also tuned the white balance to make it more cool white toned.

Figure 3. Left: Raw image. Right: Final edited image.

V. Image Overview

I like some aspects of this image, but there are some things I would change if I did it again. I did not love the focus of the image, it is a bit fuzzy. I think I could have easily fixed this if I took them in a more well lit environment.I also wished I had changed some of the settings on my camera instead of keeping them the same as the first time to better suit this set up. Otherwise, I really enjoyed the color contrast and swirls in the image. I would be curious to see how it would look if I had added more colors.

References

[1] *Physics presentation: Internal energy conservation*. Physics presentation: internal energy conservation. (n.d.). Retrieved October 8, 2021, from https://waiferx.blogspot.com/2014/11/physics-presentation-internal-energy.html.