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Flow Visualization, MCEN 5051 – 001

Image Video Assignment 1 Report

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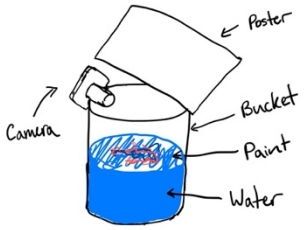
The purpose of this image was to capture the non-diffusive mixing that happens during the process of hydro dipping (also known as water transfer printing or immersion printing). This process is when a layer of paint is created on the surface of a calm body of water. An item is then dipped through the film of paint into the water, essentially transferring the paint from the water to the item. There are multiple ways to achieve a layer of paint. In this instance, spray paint was used as some other options require printing premade designs and omit the non-diffusive mixing we were looking to capture.

This particular image was created using an orange five-gallon bucket. The orange color isn't required, and neither is the bucket size. What matters is having a calm and controlled body of water to create the layer of paint. Three multicolored spray paints were then sprayed directly into the water from roughly 5-6 inches away. Unfortunately, I am not qualified to comment on the fluid dynamics of spraying paint into water. However, hopefully, I will be detailed enough for someone to recreate and study it themselves.



The paint used for this photo were three cans of Rust-Oleum's Painter's Touch® 2X Ultra Cover® Spray Paint in three colors, 'Fire Orange', 'Green Apple', and 'Midnight Blue'. All three of these paints also have a satin finish. This image was taken on a fall day outside. A poster was placed over the top of the bucket to prevent distracting reflections. The majority of lighting was natural and diffused through the bucket's sides, resulting in a softly lit subject. Only a small flash on the top of the camera was used to brighten the subject.

This photo was taken at a focal length of 55mm at roughly 8 inches away. The image was taken using a mirrorless camera and a kit lens. The image has a resolution of 6000 by 4000. The photo was taken using a Fujifilm XT-2 camera. The camera settings for this photo prioritized a broad in-focus range with minimal blurring. This was in order to keep as much information as possible in the image. To make this happen, an aperture of 22 was chosen. Next, the shutter speed was prioritized to minimize motion blur as this shot was taken handheld. This photo was taken at 1/30 of a second. Finally, ISO was last in line. This is mostly due to the availability of noise reduction in postprocessing. Therefore, the ISO was set at 3200. The image was minimally edited to increase contrast and reduce the orange tinge across the whole image.

Among other things, the image reveals aesthetically pleasing, organic shapes. The image's resolution contains enough information to allow for heavy use of the zoom feature to gain a more detailed view of the non-diffusive mixing patterns or lack thereof. Therefore the high resolution

of the image and the lack of cropping are an intentional benefit and a reason I am pleased with the final image. With this being said I would hope to learn more about the flow and possibly exciting phenomena in this image. This would allow me to crop in more and take advantage of the higher resolution. Along with this, there are a few paths that may have impressive results—first viewing the paint from under the water during the spraying stage. I'm unsure how deep, if at all, the paint goes under the water, and this would help answer that question. Another approach would be to using a macro lens. This would allow for much closer and detailed images of the intricate mixing in the photo. Another idea would be to dip something into the paint to observe the paint transfer from water to object. There seem to be lots to explore and possibly new and beautiful photos to be taken while observing the hydro dipping process.