“TEAM FIRST”

Image Context Report

ABSTRACT

This report will provide context for my first team image in the fall 2016 flow visualization class.

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Flow Visualization: The Physics and Art of Fluid Flow

1 Context and Purpose

I am very excited to speak about my teams first set of images together for the "team first" assignment. Our team was interested in exploring with non-newtonian fluids. Our team gravitated towards the substance called "oobleck" because of its easy recipe and low cost. When we made our first batch of oobleck we were very intrigued by its shear thickening properties. When our team made our first large batch of oobleck, we weren't very impressed by its beige color. We decided to make several different sub-batches of oobleck that were dies using various colors of food coloring. We made eight different sub batches with different die colors and various viscosities. To capture the shear thickening properties of the oobleck we placed a small amount of oobleck on an angled surface. We photographed the oobleck as it dripped down the angled surface.

2 Flow Apparatus

The flow apparatus in this case was the angled surface that we used for dripping the oobleck. We used various different surfaces to try and capture the shear thickening properties with my camera. We used a sheet of acrylic first. We ended not liking the results because the reflection in the acrylic was very distracting, it acted almost like a mirror. The next surface we used was foam core. This material was rather successful in creating a monochromatic, non-distracting surface. We used black and white foam core in different trials. The image that was chosen was a trial on the white foam core. The boards were propped up on a kitchen chair to achieve the slant. We achieved the varied amount of board tilt by attaching several objects with adhesive to the seat of the chair various distances from the edge. We would rest the bottom of the board against one of these objects to achieve the desired slant. The closer the bottom of the board was to the edge of the chair, the less the magnitude of the slant angle.

Figure 1 - Series of white foam core trials

As seen above in figure 1, our team did several different trials on white foam core. The different trials were varied in their slope, oobleck color(s), and surface size. The trial that my photograph was taken from was the left most foam core board.

3 DESCRIBE THE VISUALIZATION TECHNIQUE

You can see the differences between the original and final image due to post processing in the figures below. Figure 2 is the original image before post processing, while figure 3 is the final mage after post processing has occurred. The first aspect that may be noticed is the masking of the red splatter in the center of the image, this occurred because I viewed the splatter as distracting form the image and flow. The final image was cropped to remove the negative space on the right hand side of the original photo. There was an increase in color saturation that made the oobleck colors more vibrant. Lastly, there was an increase in contrast I the photo to try and make the background as uniform and white as possible.

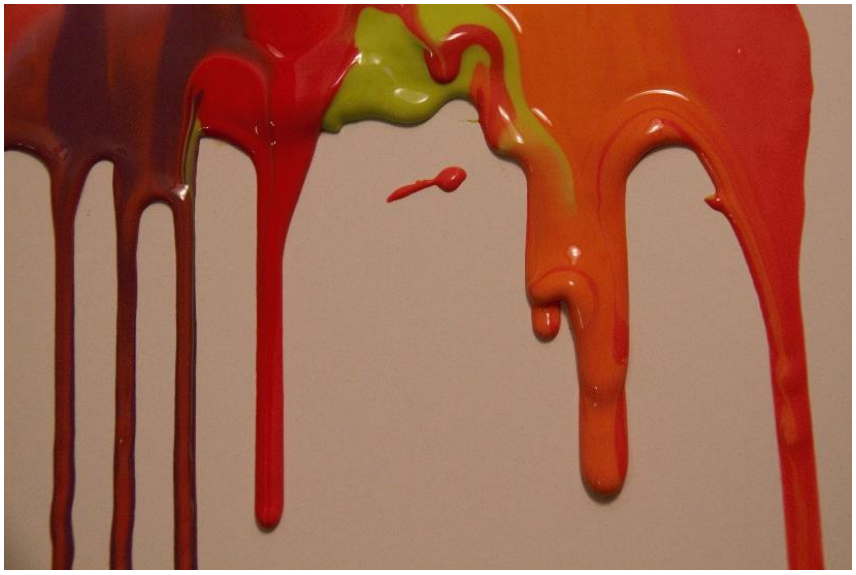

Figure 2- Original image before post processing

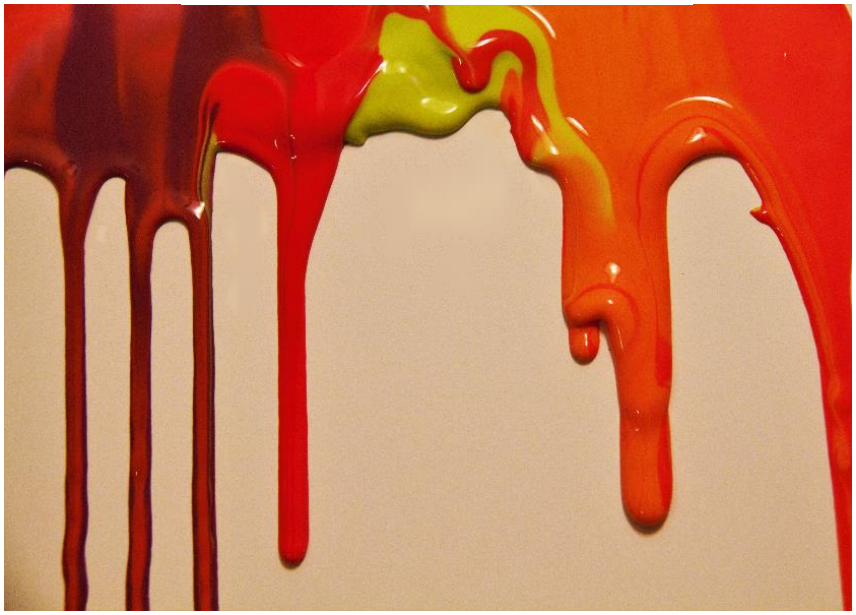

Figure 3-Final image after post processing

4 PHOTOGRAPHIC TECHNIQUE

Ill begin my discussion on my photographic technique with my camera. I am using a Canon 7D DSLR camera body. Capable of achieving 18.1 MP of resolution in its highest quality mode. The camera has a ABS-C sensor, not a full frame. At the time I was using a Canon 18-200 mm F/3.3-5.6 lens. The lens had a UV eliminating Tiffen filter. The camera modes for this particular image were as follows, F/ 6.3 (lowest with the current zoom state of lens), ISO-1600, Exposure time of 1/40 sec. With a focal length of 50 mm focal length at the time. The oobleck pictured in the foreground is approximately 3 feet away.