Flow Visualization

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Get Wet Report

Saud Alobaidan

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The photo I took demonstrates the concept of density where three liquids are in a drinking glass with three different objects. The purpose of the image is to illustrate the density phenomena as well as mixing liquids and food coloring and observe what could occur in terms of liquid flow in different layers; furthermore, it's the second project of the course. False starts occurred where fluids were mixed at the same range of densities, such as milk and water. However, after further research of various densities, water, vegetable oil, and corn syrup were chosen to satisfy the intent of the picture. No teammates were involved helping with this picture.

To describe the flow of the image, it consists of three different layers. Each liquid layer has its own characteristic due to the fact that density is a property of a substance. To start from the top, oil is the least dense liquid as it is made from hydrogen and carbon. The next layer is water which is made from oxygen and hydrogen as its denser than oil. Thus, oil molecules repel water molecules. Lastly, corn syrup is the denser liquid between the three and it is made from glucose. To calculate the density of any liquid, it is equals to the mass of the liquid divided by the volume of the liquid. Now the objects that were used were a ping pong ball, 3 bolts, and a grape. The bolt is the denser object; in fact, it is denser than the syrup. The grape is denser than water; however less dense than syrup. When the grape bends the surface, it really shows the boundary layer. The ping pong ball is on top because its less dense than oil. All in all, figure 1 below confirms the phenomena explained.

Figure 1: Get Wet Final Image

The visualization technique used is mixing unique fluids. The materials used were an 8 oz drinking glass, and a dinner table. The picture was shot at a temperature of 70 degrees inside an apartment. The lighting used was a flashing camera and a basic light inside a kitchen. The chronological order on how to achieve this final image is first I started filling the glass with water and then I added food coloring to differentiate it with the syrup. Then, I added the corn syrup with food coloring, and lastly vegetable oil. The three liquids didn't mix as expected, and then the objects were placed.

Nikon D80 was used to capture the image with an EFS 55-200 mm lens. Also, it was under an aperture exposure mode with an aperture of F4, a shutter speed of 1/60, a focal length of 55 mm, and an ISO setting of 1000 with a flash used. The distance between the camera and the desired object was approximately 15 inches. The final cut processing was done using Gimp as a photo editor. Gimp was used such that the picture could be cropped, changed in exposure and contrast, and lastly the background.

This image reveals the beauty of mixing three unique fluids all together in a drinking glass. What I like about the picture is that it shows how many layers there are as it is interesting to look at. Further, I like the background because the colors go well all together, and the simplicity of the background makes the picture more authentic and realistic. What I dislike about the image is that the different layers and objects could be clearer. What I would do to improve the project is it make a slow-motion video by dropping the objects into the liquid and observing where the objects would go.