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Flow Vis. Spring 2012
2/14/12

Get Wet; Beads and Soap

For my "Get Wet" assignment I chose to experiment with photography as I have not had much experience using still images. I am a film major so I wanted to challenge myself with a different medium. The fluid phenomenon I was trying to capture was the surface tension of a dense liquid. To create a setting in which this phenomenon could have been captured I used regular dish soap. In the image, I captured the soap dripping down from two dangling strings of Mardi-Gras beads. The intent of the photograph was to capture an image of soap as it dripped down the beads while keeping clear focus on the soap. How I was able to make it happen I will later elaborate on.

To re-create this image the following steps must be taken. Place two tall pint glasses three inches apart for each other in the middle of a regular kitchen sink. Hang a string of small mardi-gras beads between the cups. The necklace should not be cut, as there will be two individual "strings" hanging down that are apart of the same necklace. The beads are about 1/4 inch in diameter (smaller than the average mardi-gras necklace) and are hung with the first, lower string about 3 inches from the top of the cup and the second string 2 inches from the top of the cups. The light source should be a very bright florescent light tilted at a 45 degree angle and placed roughly one foot away from the hanging beads. The room in which the photo was taken should be lit also in an average kitchen setting as to make the shadows less harsh. The soap was poured out of the dish soup bottle about 8 to 10 inches above the top of the glasses and was moving back and fourth along the beads. The photographic techniques I used to take the image I will later

elaborate on.

The fluid phenomenon seen in this image, surface tension, can be seen in many experiments using liquids. "Caused by the cohesion of similar particles" (1) surface tension can be seen here because the drops of soap slow down as a result of touching the beads on the string. When the soap touches the string of beads, surface tension allows them to stick to the string until the force of gravity is stronger then the tension and causes the soap to finally drop. As for the physics of the drop itself, I came upon a very interesting article suggesting that a drops "break off point" exhibits fractal qualities. (2) That is to say "a slice through it (a drop) looks the same at any time if you rescale the axes." (2). I found this to be most interesting because fractal qualities are found in almost everything in nature.

The visual technique I used for this assignment dealt with the motion of dripping liquid, and in this case dripping dish soap. The set up for the experiment has already been described but the reasons for the decisions I made I will discuss. As for the lighting I used a sunlamp and wanted to have a very bright setting so I could experiment with a faster shutter speed because the soap was dripping rather quickly. I did not use a flash because the soap was already well lit. I wanted to have two strings of beads so there would be more drops in the image. Cropping was essential in the final image and the camera techniques used were all made with a specific intent.

The size of my field of view after cropping is about 3"/ 3" with the background being only about 6" away from string. The camera and tripod were about 2' away pointed down on the beads at about 15 degrees. The lens was 18mm-55mm zoomed in all the way. The focus was manual and the middle of the depth of field was centered on

the drops. To take the photo I used a digital Canon XTI Rebel with all manual specs and exported in a raw file. The export had width of 1421 pixels by a height of 1027 pixels. Like I mentioned before I wanted to use a fast shutter speed to freeze the drops in time as well as I could. The shutter was 1/160 sec. This caused aperture to be fairly wide open at an f-stop of 5.6. I used an ISO of 400. For the effects I used in the image I experimented iPhoto and adjusted the following settings until I found something close to my intent; exposure, contrast, highlights, shadows, saturation, temperature, tint, sharpness and reduction noise. Attached is a screen shot of the settings I used for the final product.

In looking back at my final image I found that its purpose was achieved. I wanted to show in a high detail how gravity effects soap when it hits a string of beads. My experimentation with iphoto was perhaps over used but it gave me a good introduction into photographic editing. To improve this image I would have done more takes on the experiment and perhaps used more soap. Further expanding this experiment I would have used a macro lens and would have experimented longer with iphoto in order to achieve the purpose of my intent.

Bibliography

1) Wikipedia- *Surface Tension* “http://en.wikipedia.org/wiki/Surface_tension” (2012)

2) Itai Cohen, Michael P. Brenner, Jens Eggers, and Sidney R. Nagel. *Focus: Watching the Faucet Drip.* Phys. Rev. Focus 4, 9 “http://physics.aps.org/story/print/v4/st9”(1999)

Iphoto settings;

QuickTime™ and a
decompressor
are needed to see this picture.

Image Assessment Form
Flow Visualization
Spring 2010

Name(s) Nick Beato

Assignment: Date:

Scale: +, ! = excellent √ = meets expectations; good. ~ = Ok, could be better. X = needs work. NA = not applicable

Art	Your assessment	Comments
Intent was realized	!	My intent being to experiment
Effective	√	Too much iphoto
Impact	!	Great color
Interesting	!	Soap and gravity
Beautiful	!	Color
Dramatic	√	Overly iphoto

Feel/texture	!	Because of iphoto
No distracting elements	X	Distracting bright background
Framing/cropping enhances image	!	Experiment achieved

Flow	Your assessment	Comments
Clearly illustrates phenomena	√	The flow was kind of elementary. I think I could have taken it further.
Flow is understandable	√	
Physics revealed	~	
Details visible	!	
Flow is reproducible	!	
Flow is controlled	√	
Creative flow or technique	~	
Publishable quality	√	

Photographic technique	Your assessment	Comments
Exposure: highlights detailed	!	I thought I did very well in this section.
Exposure: shadows detailed	!	
Full contrast range	√	
Focus	!	
Depth of field	!	
Time resolved	!	
Spatially resolved	!	
Clean, no spots	√	

Report		Your assessment	Comments
Describes intent	Artistic	!	The report is well written, I thought I exceeded the physics part- being a film student. Very sorry its late.
	Scientific	√	
Describes fluid phenomena		√	
Estimates appropriate scales	Reynolds number etc.	-	
Calculation of time resolution etc.	How far did flow move during exposure?	-	
References:	Web level	!	
	Refereed journal level	!	
Clearly written		!	
Information is organized		!	
Good spelling and grammar		√	
Professional language (publishable)		√	
Provides information needed for reproducing flow	Fluid data, flow rates	√	
	geometry	!	
	timing	!	
Provides information needed for reproducing vis technique	Method	!	
	dilution	!	
	injection speed	!	
	settings	!	
lighting type	(strobe/tungsten, watts, number)	~	
	light position, distance	!	
Provides information for reproducing image	Camera type and model	!	
	Camera-subject distance	!	
	Field of view	~	
	Focal length	~	
	aperture	!	
	shutter speed	!	
	film type and speed or ISO setting	!	
	# pixels (width X ht)	!	
	Photoshop techniques	!	
	Print details	!	
	"before" Photoshop image	√	