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2-14-12
FlowVis
Report 1

Get Wet

I have always been interested in the dynamics between smoke and fire. I had originally intended to try to visualize how a rapid burst of flame would affect a cloud of fog. Unfortunately my fog machine stopped functioning the day I decided to try to create my video. I did still have a Digital SLR, a bottle of nail polish remover, and some fire; so I decided to play. I found that when the flame had finished burning yellow, the blue flame that remained danced quite elegantly and would be the only thing visible in a totally dark room. I was very attracted to the way the flames moved back and forth over the puddle and decided that they demonstrated an interesting fluid phenomena.

I poured a rather large puddle of the nail polish remover on the ground, dipped a q-tip in Vaseline, lit it and dropped it on the puddle. With this large puddle, the orange and yellow flame burned rather high and long. The blue flame then turned out to be in a few scattered spots and did not burn as long. I found that a smaller puddle would yield a much shorter yellow flame and a much more full blue flame. I think this is due to the fact that when the flame had more fuel, it burned more intensely, evaporated more quickly at certain concentrations of nail polish remover, and left spots that had exhausted the fuel before the flame turned blue. The flame sent waves back and forth over the puddle due to the fact that it is burning the fumes that are coming off of the puddle and not the actual liquid. Due to the make up of the nail polish remover, not all of the liquid actually burned. A small puddle of water (and probably a few more chemicals) was left over after each burn.

In order to capture my visualization, I set a digital SLR camera on a tripod about two feet above the ground and angled it down where my puddle would be; about 3 feet from the camera. This allowed me to see the hight of the flame as well as how it moved across the floor. I then poured a small puddle of nail polish remover with acetone over an eight inch area, pouring at one spot and letting the liquid spread itself out. Finally, I turned out all the lights, lit my q-tip that I had dipped in Vaseline, hit record and dropped the q-tip on the nail polish remover. The flame burned for about a minute in all, however I was primary interested in the 30 seconds where it was prominently the less intense blue flame. The yellow flames give off more light so you can see the floor the flame lies on. The blue flame only gives of enough light for its own visibility and appears to be detached from any particular space.

I captured the video with a Canon Rebel T3i DSLR. I had the Zoom lens set to about 75mm and shot the flame about 4 feet from the lens of the camera. The shutter speed was set to 160 because I wanted to capture at 60 frames a second. This, in combination with the fact that I wasn't shooting with a lighting set up led me to need a higher ISO, about 700. After I had captured my image, I adjusted sections of the 30 second clip I wanted to show to play at varying speeds, all less than half the original frame rate. I also did a little color correcting in Final Cut to try to bring out as much of the flame as possible. Unfortunately, after seeing the image projected larger I found that this also added some noise into the black background. I plan on color correcting in Color, which should yield a cleaner final image, and resubmitting the image.

This image reveals how the fumes burning off of a puddle of nail polish remover cause flames to dance back and forth, burning up any fuel as it becomes available until the flammable chemicals have been exhausted. I like that slowing down the image reveals the elegance in what can look fairly

chaotic at times. I am still interested in how a flame will effect a cloud of fog; I may pursue that idea in a future project. I would also like to see how loud music would effect a long burning flame like this. Overall I am satisfied with the flow I captured and how the image turned out.

Image Assessment Form
Flow Visualization
Spring 2010

Name(s)

Assignment: Date:

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

Art	Your assessment	Comments
Intent was realized	√	
Effective	√	
Impact	!	
Interesting	√	
Beautiful	!	I love to watch fluids at slower FPS
Dramatic	!	Changes over time
Feel/texture	√	
No distracting elements	~	Grain in background
Framing/cropping enhances image	√	

Flow	Your assessment	Comments
Clearly illustrates phenomena	√	
Flow is understandable	√	
Physics revealed	√	
Details visible	√	
Flow is reproducible	√	
Flow is controlled	√	
Creative flow or technique	√	
Publishable quality	~	Needs cleaner color corection

Photographic technique	Your assessment	Comments
Exposure: highlights detailed	!	You can see every detail in the flame
Exposure: shadows detailed	~	
Full contrast range	!	
Focus	√	
Depth of field	√	
Time resolved	!	
Spatially resolved	√	
Clean, no spots	~	Grainy background