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IV 3 Report
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The purpose of this project was to visualize the flow of tea diffusing in boiling water. My intentions were to use a macro lens to get extremely close to the subject to emphasize the tiny wisps of laminar and turbulent flow. I also wanted to create another meditative piece like my first Flow Visualization project.

The apparatus that I employed was a cylinder glass sitting on top of a tissue box with a bike light inside. Two LED lights were also used to top light the subject and give a more even lighting set up. The purpose of the bike light was to light the glass from the bottom in order to avoid the flow being backlit from the two LEDs. The tissue box made for the perfect elevated surface for the glass to be even with the camera's lens, and was a great practical light source. A blank white piece of printer paper was used to act as a background and a bounce board to serve as a fill light. I boiled the water in an electric Cosori kettle, and poured it into the glass before adding the pouch of tea. The flow moved slower than expected, and almost seems like a slow motion video when, in fact, it is a real-time video.

The visualization technique was tea in hot water. The tea used was a single pouch of Celestial raspberry tea purchased from Safeway in Boulder Colorado. Nothing extra was done to the hot water or the pouch of tea. The lights I used were two Neewer LED lights and one Schwinn white LED bike light. I turned off every other light in the apartment to avoid any pulsing from the fluorescent lights in the kitchen. The lights were positioned to the left and right of the camera and tilted at an approximate 45 degree angle to provide even lighting. The tea was vibrant on its own, but post processing was employed to give it an extra pop.

To achieve this video an iPhone 8 with a macro lens clip was used along with the FiLMiC Pro application shot at 24fps. This video has a 16:9 aspect ratio with a HEVC codec. The video was edited and color graded using Davinci Resolve, and was exported as a MOV file in H.264. The exported video was then compressed in Handbrake to a MP4 file to minimize the file size. The 3.99mm lens was positioned as close as possible to the glass of water (approx. 2cm), and a pencil was



Fig. 1

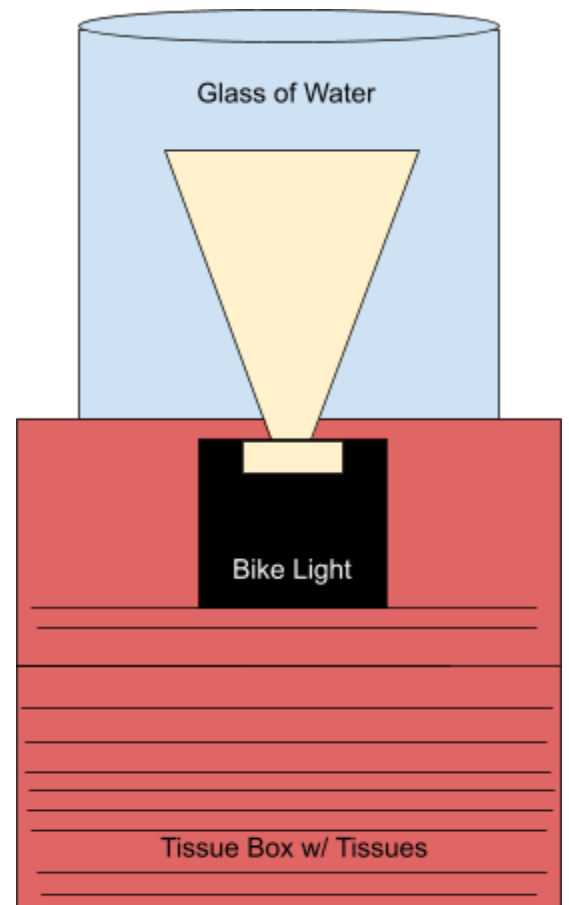
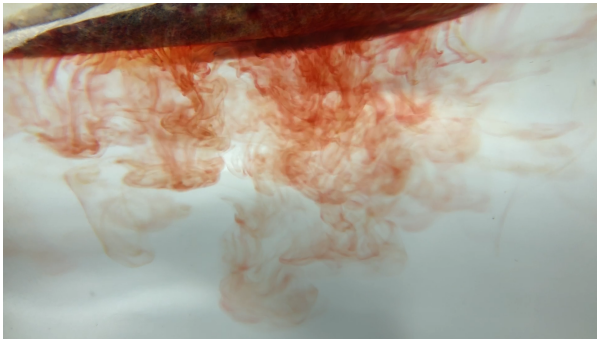
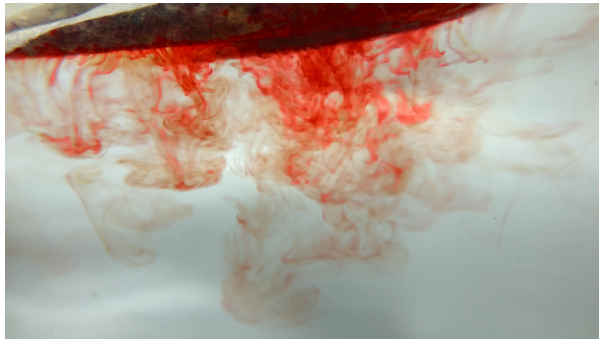


Fig. 2

used before adding water to get a sharp focus in the center of the glass. The phone's lens has a fixed aperture of f/1.8 and the macro clip lens was 12.5x. A 33 ISO and 1/192 shutter speed was used to achieve the desired exposure, and the focus was cranked as shallow as possible. A separate video was recorded at 240fps to be played back as a slow motion video, but the focus and motion was not ideal. The sound design used was the native audio of the water being poured into the glass, and I recorded myself playing two suspended chords on the guitar that were also reversed in the editing process. For color grading, I first normalized the color curves of the video and then used a qualifier in Davinci color to single out certain hues of the red within the tea. Once the qualifier was set, I increased the red value of the image using the offset red slider and also slightly decreased the blue and green sliders to balance out the color shift.

Ungraded Video	Graded Video
	
Fig. 3	Fig. 4

The video displays the enchanting way in which tea diffuses into boiled water. I really enjoyed making this project because it was so simple for such a fantastic result. I wished that I was able to frame the entire glass of water to get the entire flow, but then I couldn't use the macro lens and get the finer details of the flow. Another difficulty was the unpredictability of how the pouch of tea would float or sink once submerged in the hot liquid, but I am happy with how the composition turned out. I believe I met my goal for this project, and I am happy with how the post processed image came out. I think that a different direction this project could take is to attempt the slow motion video again to intercut with the real-time footage, or use a variety of different colored teas.