Dimario Cancanon

Professor Hertzberg

MCEN 4151-001

14 December 2019

Team Third Assignment – 2019 Fall

The purpose of the Team Third Assignment is to capture a complex flow as a team. Team four decided to use schlieren photography in order to capture the heat from a lighter flame. We used a parabolic mirror, a light source, and various filters to achieve this effect.

Team four conducted a simple version of schlieren photography. The setup for our schlieren photography experiment is shown in figure 1 below. Our parabolic mirror had a focal length of 4ft so the mirror and DSLR were placed roughly 8ft apart. A 13 W light source was placed next to the camera and shined directly towards the mirror, indoors with no other lights on. A colored filter was placed in front of the DSLR. I held the light, as Alejandra Abad recorded the video, and Jamie Frankel lit the lighter. Jamie moved the lighter front of the parabolic mirror and Alejandra adjusted the colored filter throughout the video.
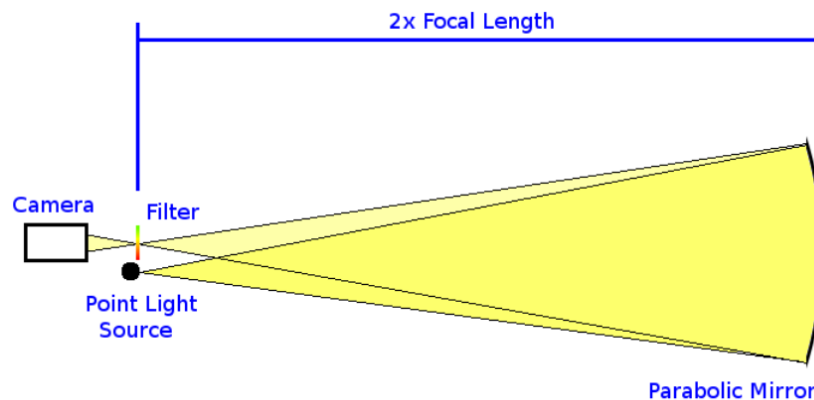

Figure 1: Project Setup [1]

Schlieren photography relies solely on light and refraction of light due to differences in the air's density. In a schlieren system, the deflected light rays interact with some kind of an opaque (knife edge) or transparent (filter array) obstacle. In this experiment we relied on the filter array to block light This interaction varies the distribution of light at depending on the degree to which the path of the rays was deflected. The obstacle and the light source work together and acts as a discriminator which makes visible deflected light beams. This creates what is known as the schlieren effect [2].

The video was captured using a Canon EOS 80 D. The focal length of the lens was 70-200mm. The distance from the object to the lens was roughly 8 feet and the object was a sphere roughly 6 inches in diameter. The exposure specs are as follows: F-stop – f/4.5, exposure – 1/160 sec., ISO – 1000, and flash mode - none. The original and final video has a width of 1920 pixels and a height of 1080 pixels. I cropped and edited the video using the windows 10 video editor app. I added royalty free background music called "STVRBOY" from cfmfreemusic.com. Although I added transitions, music, and cropped the video, I did not alter the actual video itself.

This was my first video submission for the year and overall it was a success. I was able to gain some experience video editing and capture a unique flow using schlieren photography. As a team, we were able to use colored filters and a lighter to view the air! The colored filters and music show the beauty of this technique and I hope to capture the schlieren effect again in the future.

Works Cited

[1] Davidhazy, Andrew. "Schlieren Photography - How Does It Work?." IAN, Smith.ian.org,

2008, http://www.ian.org/Schlieren/HowTo.html.

[2] Davidhazy, Andrew. "SCHLIEREN PHOTOGRAPHY PRINCIPLES." IAN, Smith.ian.org,

2008, https://people.rit.edu/andpph/text-schlieren.html.