Our group has not gotten higher order aberrations to work yet, but I included it as related content and as a task for the future.

Huang’s algorithm gives an error for the text image, and our group used his original code.

Huang’s algorithm is blue because of the extra exposure time.

I thought I did account for interference. If two different light rays land on the same part of the screen, their magnitudes effectively add up. Each pixel on the sensor is equal to sum of the Gaussian function of the area around the pixel.

I will get the physical experiment of the backward method if possible. There are currently problems with the pinhole mask. Also, note that the lens array display in our group does not work.

I am still getting some results for the backward method in for chapter 9.

Chp 4 revise

Conclusion not too close to peter’s

In the projection step of the algorithm, we compute all possible points on the display for each point on the sensor. The function $f\_d$ applies Gaussian ray tracing, where the sensor pixel $p\_s$ corresponds to a point on the focus plane $o\_f$, and we check whether a ray traveling from $o\_f$ in the direction of $o\_c$ is blocked by the aperture or pupil. If not blocked, the intersection of the ray and display plane $o\_d$ is added to the list of display points for the sensor pixel. $f\_d$ is applied for every pinhole. The RGB channels are not taken into consideration to make sure that the number of red, green, and blue hits are equal. Like the forward method, there are no matrices involved, although it is possible for generate the projection in matrix form.

In the projection step of the algorithm, we compute all possible points on the display for each point on the sensor. The light ray travels from the sensor pixel $p\_s$ to the center any pinhole $o\_c$, and if not blocked by the aperture, to a point on the display pixel $p\_d$. We draw such a ray for every pinhole and check if the ray is blocked by the aperture or pupil. The RGB channels are not taken into consideration to make sure that the number of red, green, and blue hits are equal. Like the forward method, there are no matrices involved, although it is possible for generate the projection in matrix form.

\footnote{The R, G, and B channels are ignored for simplicity.}

Rerun 5x5 pinhole

3x3 pinhole 75 micron pinhole 100 aperture samples