# 2IMV20 Visualization: Report Assignment 1

Lois Nijland (0860184), Joost Pieterse (0848231)

**Ray casting**

**MIP and compositing ray functions**

*Implementation*

*Pros and cons*

*Results*

**Tri-linear interpolation**

*Implementation*

*Results*

**Responsiveness**

The raycaster becomes quite slow when using the application. To increase responsiveness during user interaction we introduced the so-called interactiveMode. This indicates whether there is a lot of user interaction. We check if this is the case, so if interactiveMode = true. If so, we increase the step variable to n, whereas before this was 1. By increasing it to n only 1 in each n values of a vector is read. This significantly increases responsiveness. However, since we now only look at one nth of the values, the resulting image will have a lower resolution. So, we had to make a tradeoff between responsiveness and the quality of the image. We did this by investigating different possibilities.

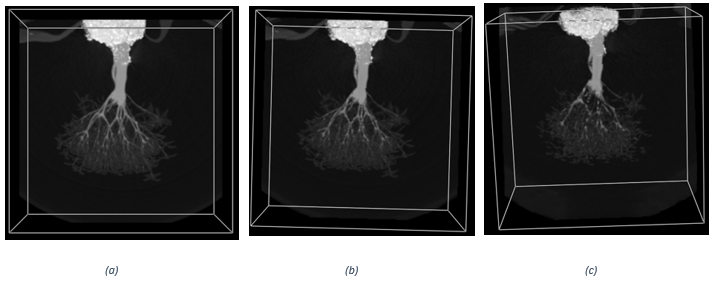


Figure 1 In (a) step is 1, in (b) step is 4, in (c) step is 8

As can be seen in Figure XXX , the quality of images (a) and (b) does not differ very much, whereas image (c) differs significantly from image (a), particularly visible in the smaller roots of the tree at the bottom.

When interacting with these different step values, we found that the interaction of (a) is quite slow, the interaction of (b) is acceptable/okay and the interaction of (c) is somewhat faster than (b).

Therefore, we found that setting (b) gave the best resolution and interaction combination. So, we choose n to be equal to 4.

**2-D Transfer functions**

**Gradient-based opacity weighting**

*Implementation*

*Results*

**Extended triangle widget**

*Implementation*

*Results*

**Illumination model**

*Implementation*

*Results*

**Comparison of techniques**

Compare the results obtained from various data sets of the different approaches

The comparisons should clearly demonstrate the strengths and weaknesses of each of the techniques.

For “results”: the techniques should be applied to several data sets, interesting details in the data should be reported by showing a good set of transfer functions. The exploration process should involve extensive experimentation with the parameters of the various approaches.