In this thesis, we go through the process of improving a research renderer called ART. We focus primarily on the image sampler. We analyse the shortcomings of the stochastic sampler that was present before this thesis was written.

Those being the huge memory consumption, lack of real-time visualization, and a limited communication channel between the renderer and the application that is supposed to control it.

We then design two samplers that could serve as a replacement. We choose the one which seems to be better suited for the task.

We then run a series of tests which serve to finetune parameters of the new sampler and also serve as a comparison between the new and the old sampler. By using the data from the tests we show that we have reduced the memory foot-print while maintaining the speed at mostly the same level as before while enabling working with greater number of cores.