

Current methods for realistic rendering approximate surface microstructure using a smooth normal distribution function. This approach is not sufficient for the rendering of shiny surfaces with details (such as scratches) visible under bright light in real world. It is possible to model surface structure with high-resolution normal maps, but this approach leads to unreasonable rendering times when used with modern rendering methods based on stochastic sampling. In this thesis, we explore some of the approaches specifically designed to address this problem. As a main topic we choose the algorithm proposed by Yen et al. [2016]. We analyse, implement it, compare it with other approaches and propose some improvements. As a part of this work we implement a rendering system based on the path tracing algorithm, which is used as an environment for testing and visualization of our results.