The problem of accurately simulating light transport using Monte Carlo integration can be very difficult. In particular, scenes with complex illumination effects or complex materials can cause a scene to converge very slowly and demand a lot of computational time. To overcome this problem, image denoising algorithms have become popular in recent years.
In this work we first review known approaches to denoising and adaptive rendering. We implement one of the promising algorithm by Moon et al. [2014] in a commercial rendering system Corona Standalone Renderer, evaluate its performance, strengths and weaknesses on 14 test scenes. These include difficult to denoise and converge rendering effects such as fine sub-pixel geometry, participating media, extreme depth of field of highlights, motion blur, and others.
We propose corrections which make the algorithm more stable and robust. We show that it is possible to denoise renderings with Linear Weighted Regression only using a CPU. However, still even after our propositions, it is not possible to filter scenes in a consistent manner without over-blurring or not filtering where desired.