Abstract

Modern graphic cards can perform extreme amounts of calculations. In addition, the problem within the field of computer vision is often that the algorithms are very time consuming. The objective of this thesis is to find solutions to the stereo matching problem, employing dense local two-frame stereo matching algorithms and hardware support within modern graphic cards. The performance of the implementations is measured against CPU-algorithms, to test the advantage of the shader approach.

The algorithms were examined in Matlab and thereafter written in C++, using the DirectX API. Several different local area-based algorithms were tested and implemented as separate components (filters). The separate design created flexibility and testing became easy. The shader programming was done with standard DirectX assembler, for high control and efficiency.

The results clearly indicate the advantage of implementing algorithms from image processing by using commodity shaders instead of the CPU.