Research of the efficiency of parallel algorithms implementation of interpolation methods for scaling raster images using specialized calculators

Andrey Vnukov, Maxim Shershnev
NRU HSE

Abstract: This work is devoted to the study of various methods for interpolating raster images. Such methods as bicubic interpolation, bilinear interpolation, nearest neighbor method and directed interpolation are considered. The purpose of this paper is to investigate the effectiveness of applying parallel programming approaches to image scaling algorithms.
In the course of work, the above algorithms were adapted to run on Nvidia CUDA multiprocessor computers. A program is developed using C, C ++, CUDA C, which allows you to scale images in different ways and with the ability to choose the degree of parallelization of computations. As a result of the work, a study of the efficiency of parallel scaling algorithms has shown that the use of multiprocessor computing devices allows to significantly accelerate the operations of image scaling. Also in the course of the work, a comparison was made between the above methods for the speed of work and the quality of the result obtained.

Keywords: methods of interpolation of images, parallelizing an algorithm, Compute Unified Device Architecture, parallel computing, multithreaded computing, distribution of computing.