WebAssembly and Vulkan API in Image Processing Development

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Abstract

This paper will present an image processing program, named BlackRoom. The software implements a lot of modern techniques like Vulkan, tile rendering and WebAssembly.

The calculation of the different effects on large size images induces a huge memory consumption. With the usage of tile rendering, this memory allocation can be decreased at the cost of a slight calculation performance. The integration of the Vulkan API is also a way to increase the efficiency of applications. Beyond OpenGL, Vulkan provides low-level access to the hardware. In order to point out the difference between the applied technologies our program has a built in benchmark system to determine the performance of the CPU and GPU through the implemented executing branches.

Further aim is to make the program available for as many platforms as possible by paying special attention to WebAssembly. By generating WASM binary our application runs without installation in a browser.

Keywords: WebAssembly, Vulkan, tiling, memory optimization, image processing, benchmark system.

MSC: 65D18, 68U05, 97R60

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