

Posudek diplomové práce

Matematicko-fyzikální fakulta Univerzity Karlovy

Autor práce Bc. Michal Wirth
Název práce Advanced HDR image viewer
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Studijní program Informatika **Studijní obor** Softwarové systémy

Autor posudku doc. Ing. Jaroslav Křivánek, Ph.D. **Role** Vedoucí
Pracoviště KSVI

Text posudku:

The presented diploma thesis deals with the design and implementation of an advanced viewer of High-dynamic range (HDR) images. The work consists of a detailed requirement analysis for an HDR viewer, including identification of typical user groups and their needs. After that, an exhaustive review of existing software solutions available on the market is presented and it is concluded that none of them is suitable for the needs of the target user groups (casual 3D artists, professional 3D artists and cloud rendering services, i.e. render farms). Based on this finding, a new software is designed that would fulfill these requirements. The implemented software suite consists of a command-line application and a GUI-based application for viewing and also basic processing of HDR images. The implementation of processing operations themselves (various image filters such as bloom and glare, denoising etc.) are not the original work of the candidate - he has used their implementation from the core of Corona Renderer. The main original contribution is a software architecture for connecting the individual building blocks together, along with its C++ implementation. The final implementation bears similarities to some of the established solutions in computer graphics software, such as the Direct Acyclic Graph connecting scene nodes in the Autodesk Maya software. Furthermore, the candidate has tested the performance of an example image processing operation on two different image layouts (array of structures and structure of arrays) and concluded that the former provides a significantly better performance, especially when wide vectorization (AVX) is available. This is certainly an interesting result, but it is questionable how well it translates to more complex image operations such as the aforementioned bloom and glare or denoising filters. Furthermore, it would be interesting to measure what speedup one could achieve by porting the filtering operations to the GPU. My further criticism would be directed toward the thesis text itself. It gives the impression of not being as finished as it ought to be. For example, an overall scheme of the implementation is not given. The text is also missing any description of the resulting program from the user point of view. Description of the GUI design is missing. This being said, the thesis provides a good case study for software design and engineering and provides evidence of the qualities and abilities of the candidate as a software engineer. I certainly recommend the work for defense.

Práci doporučuji k obhajobě.

Práci nenavrhují na zvláštní ocenění.

Pokud práci navrhuje na zvláštní ocenění (cena děkana apod.), prosím uveďte zde stručné zdůvodnění (vzniklé publikace, významnost tématu, inovativnost práce apod.).

Datum 11. ledna 2017

Podpis