

Posudek oponenta diplomové práce

Jméno a příjmení autora posudku: Alexander Wilkie

Jméno a příjmení autora práce: Filip Krijt

Název práce: Adaptive Simulation of Large-Scale Ocean Surface

Vlastní text (sem prosím napište text posudku, délka textu posudku není omezena):

In his thesis, the candidate reports on design and implementation of a novel, hybrid system for the interactive rendering of ocean surfaces. The presented system is a hybrid insofar as it combines two approaches for ocean surface generation that, at least so far, have not been combined in a single system: it is both capable of using frequency-based wave pattern generation for large areas of open, undisturbed ocean, and an actual (if somewhat simplified) fluid equation solver for those areas of the ocean that interact with a shoreline. Each of these techniques is fundamentally unsuited for the domain of the other: frequency based techniques cannot be used for shoreline scenarios, while Navier-Stokes solvers are hopelessly inefficient for large areas of water. Which means that for scenes which feature both vistas of a shoreline and the open sea, some combination of the two has to be used.

The two key novelty aspects of the presented system are that a) these two techniques were made to run simultaneously at still acceptable frame rates in the first place (the still respectable, but smaller achievement of the two), and b) that the author has devised a technique to blend the results of these two very different simulation techniques in the transitional areas of the ocean surface in an acceptable way (the larger achievement).

The results shown by the author are at first glance perhaps not as visually compelling as one might expect, as they did not receive the amount of visual „polish“ the renderings used in a commercial product would get. But they are nevertheless significant, as they demonstrate the principle that such a blending operation can be done, at reasonable performance levels, and with acceptable appearance, in the first place. Which was far from certain.

The fact that in the provided reference implementation, the proposed technique only seems to work well for one particular wind direction is not a significant drawback for it to be potentially technologically viable in an industrial setting. Typically, games and other interactive software use coordinate systems that are optimised for the scene at hand, so the missing ability to simulate truly arbitrary wind directions is not a critical deficiency.

The actual text of the thesis is, in spite of some minor typos, well written: previous work is adequately presented, the key concepts needed to understand the thesis content are introduced, the important algorithmic parameters are discussed. Not very many result renderings are included in the thesis, but as it deals with an interactive technique, this is not a serious drawback. Any serious assessment of the obtainable results has to be done with the provided executable: and still images are not really capable of showing the performance of the blending technique.

The candidate managed to get the test implementation to yield the decent results it is capable of generating is a substantial achievement. As such, the presented work is a solid result. In the opinion of the opponent, the thesis achieved its stated goals, can be recommended for acceptance.

Doporučení k obhajobě:

Z výše uvedených důvodů práci *doporučuji* k obhajobě.

Vynikající práce vhodná pro soutěž studentských prací	ANO <input type="checkbox"/>
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Seznam soutěží studentských prací, viz <http://www.mff.cuni.cz/studium/bcmgr/prace/>

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V Praze dne: 27.8.2014

Podpis:**

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