Informatik-Oberseminar

Fachgruppe Informatik

Lehrstuhl für Informatik 8

RHEINISCH-WESTFÄLISCHE TECHNISCHE HOCHSCHULE AACHEN

EINLADUNG

Zeit: Montag, 27. Mai 2013, 14:00 Uhr

Ort: Raum 025, Mies-van-der-Rohe-Str. 15

Referent: Dipl.-Inform. Lars Krecklau
Lehrstuhl für Informatik 8, RWTH Aachen

Titel: The Algorithmic Beauty of Cities

Abstract:

Nearly everyone of us is surrounded by synthesized virtual environments every day, although it is not always obvious. For example, most graphics in any commercial seen on street posters, on web banners, or in short clips on television contain artificial content and special visual effects to make the communicated message impressive and memorable. In some cases, a cerain degree of realism is requested for the virtual environment, especially, if it is mixed with real world content. Present rendering algorithms allow for the production of synthetical images that are hard to distinguish from pictures which were taken from the real world. Even with commodity hardware, high quality renderings can be finished in reasonable time. There are many applications in practice which benefit from virtual environments. For example, many film productions use digital copies of real world locations like famous cities to easily include artificial content (e.g. crowds of people), to allow for complex camera trajectories (e.g. falling from the sky to the street level), or to simulate large scale effects (e.g. a heavy destruction of the scene). This digest of new possibilities would be very expensive or even infeasible without using virtual scenes.

One of the biggest bottlenecks in the production workflow of synthesized virtual environments is the content creation. The modeling of large scenes that provide a high amount of detail is a time consuming and sometimes tedious task. The problem is often compensated by just keeping a high number of artists busy, however, this solution is rather expensive and requires a lot of organisational overhead. An alternative solution is to generate large parts of a virtual scene algorithmically which introduces a number of interesting challenges.

In this talk, we will first discuss the fundamental formalisms of procedural modeling techniques and analyse them with respect to their application in virtual environments. Afterwards, an expressive but yet intuitive modeling language is introduced that allows for the combination of several modeling strategies and thus, enables the creation of hiearchical structures (e.g.~buildings and plants) as well as of interconnected structures (e.g.~bridges and power poles) within one unified description. Finally, an efficient rendering pipeline of large scale procedural city models is introduced. Taking a coarse polygonal model of a city as input, high quality facades with real geometric detail are generated on-the-fly such that the massive amount of data never needs to be stored explicitly.

Es laden ein: Die Dozenten der Informatik

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