INFORMATION TECHNOLOGY

Grid-Enabled Adaptive Surrogate Modeling for Computer Based Design

Dirk Gorissen
Supervisor(s): Tom Dhaene, Piet Demeester and Jan Broeckhove

Many complex, real world phenomena are difficult to study directly using controlled experiments. Instead, the use of computer simulations has become commonplace as a cost effective alternative. However, regardless of Moore's law, performing high fidelity simulations still requires a great investment of time and money. Surrogate modeling (metamodeling) has become indispensible as an alternative solution for relieving this burden. Surrogates are compact and cheap to evaluate, and have been proven very useful for tasks such as optimization, design space exploration and sensitivity analysis. Consequently, there is great interest in techniques that facilitate the construction and evaluation of such approximation models, while minimizing the computational cost and maximizing model accuracy. We present a novel, unified approach to surrogate modeling, placing a strong focus on adaptivity, self-tuning and robustness in order to maximize efficiency and make our algorithms and tools easily accessible to other scientists in computational science and engineering.

Scaling Limitations in Long-Reach, High-Split Passive Optical Networks at 10 Gbit/s

Bart Baekelandt and Cedric Mélange
Supervisor(s): Jan Vandewege

In this paper, a radically new future broadband optical access network is introduced, with specifications far beyond state of the art. Compared to the Gigabit Passive Optical Networks, which are currently being deployed in Japan and North-America, the bit rate is increased from 1.25 Gbit/s to 10 Gbit/s bidirectional, the number of customers from 64 to a maximum of 16384 and the reach from 20 km to 100 km. This network integrates access and metro networks into one system and greatly simplifies the network architecture. These spectacular features are enabled by the introduction of new technologies like optical amplification and dense wavelength division multiplexing (DWDM) into the network. The present research activity focuses on scaling limitations and fundamental trade-offs in the network, imposed by effects caused by the addition of these new technologies, notably amplified spontaneous emission noise (ASE) and in-band crosstalk.

8e UGent - FirW
DOCTORAATSSYMPOSIUM

woensdag 5 december 2007 | 14h00 | Het Pand | Onderbergen 1 | 9000 Gent

UNIVERSITEIT
GENT

FACULTEIT INGENIEURSWETENSCHAPPEN