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Pattern generation in decentralized communities

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Venue: Room G6302, City University of Hong Kong

Reception starts at 4:15pm

(Language: **English**)

Abstract

Decentralized systems (not only file sharing and P2P systems in general) are more and more in the focus of research in various scientific fields. The increasing interest is founded on two effects of economic and technical globalization: First, IT structures become more and more distributed all over the world. Secondly, processes of different contributors are connected in the global integration processes in many different and complex ways. Since it is almost impossible today, to monitor, oversee or control such systems from any central authority, the P2P paradigm became an alternative system architecture.

Nevertheless, the anarchically grown neighborhood relations in such systems may motivate several improvements with a significant impact to the performance of the system and the allocated system resources (like network bandwidth). Therefore, the main part of the presentation is used to discuss ideas for locally executed algorithms, which built special structures on top of the anarchically grown P2P system and which can then be used to improve the configuration, management and operation of the whole system. It is figured out that many analogies from nature (e.g. ants, spiders or crystals) provide valuable clues for the implementation of appropriate pattern generators.

Finally, the P2PNetSim tool is presented, which has been used to obtain the presented simulation results. This decentralized simulation tool has been developed at the FernUni in Hagen and supports the investigation of communities with up to 5 million members on up to 256 computers.

About the Speaker

Prof. Dr.-Ing. habil. Herwig Unger got his PhD with a work on Petri Net transformation in 1991 from the Technical University of Ilmenau and his habilitation with a work on large distributed systems from the University of Rostock in 2000. Since 2006 he is a full professor at the FernUniversität in Hagen and the head of the Chair of Communication Networks. His research interests are in self-organization, adaptive and learning systems, Internet algorithms and simulation systems.