ECSE Seminar on Wednesday, 14th May 2003

Title:
Dynamic Topology Partitioning for Parallel Simulation of IPv6 Networks: An Evolutionary Computation Approach

Speaker:
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Main supervisor - Dr. Ahmet Sekercioglu, Associate supervisor - Prof. Greg Egan

Abstract -
This research presents a new approach to achieve optimal partitioning of network topologies for parallel simulation of very large scale networks. The partitioning algorithm is based on the principles of evolutionary computation methods, which are shown to be effective in solving optimisation problems.

Parallel discrete event simulation (PDES) is a method of using multiple processors simultaneously for executing a single simulation. The performance of parallel simulation depends upon various factors including the partitioning of the model components among the processors, the communication overheads of the parallel platform (both hardware and software overheads), and the overheads of parallel synchronization algorithms. A proper partitioning of the simulation model allows the decomposition into a number of components that keep the computational load approximately balanced while minimizing the communication overheads.

The aim of the proposed algorithm is to split the overall topology into partitions such that the connectivity/communication loads among the simulation elements that reside in separate partitions are minimized. The outcome of this study is an important part of a parallel simulation framework, which is used for accurate performance study in various aspects of IPv6 networks.

Speaker's Background -
Eric Wu graduated with a Bachelor of Communication Engineering degree from RMIT in 1999. In 2001, Eric commenced a Master of Engineering Science degree, working under the supervision of Dr. Ahmet Sekercioglu and Prof. Greg Egan in the Centre for Telecommunications and Information Engineering (CTIE). In 2001-2002, Eric was awarded a grant by the Victorian Partnership for Advanced Computing (VPAC) to investigate performance analysis of protocol enhancements for IPv6 handover using parametric simulations. Currently, he continues working and extends his research in parallel simulation. Eric hopes to successfully transfer his degree to a PhD.