



IEEE

Ottawa Section



Seminar by IEEE Ottawa Section ComSoc, EMBS, CIS-SMCS, RS-PELS, and PES Chapters, Educational Activities, and Algonquin College IEEE Student Branch

The IEEE Ottawa Section is inviting all interested IEEE members and nonmembers to a seminar

Applications of Petri Nets in Communications - Calculation of Probability Distributions of Performance Variable in Petri Net Models

By

Dr. Faruk Hadziomerovic, Independent Consultant, Ottawa

DATE: Thursday, April 16, 2014.

TIME: Refreshments, Registration and Networking: 18:00; Seminar: 18:30 – 20:00

PLACE: [Algonquin College, T-Building](#), Room T129, 1385 Woodroffe Ave., Ottawa.

PARKING: No fee after 5 p.m. at the Parking Lots 8 & 9. Please respect restricted areas.

Abstract – A brief overview of Petri nets, as a powerful modeling tool for many systems, will be given. Models with Stochastic Petri Nets (SPN) enable evaluating system performance. Every SPN can be reduced to a corresponding Markov Chain. This presentation deals with telecommunication networks where, in addition to average packet delays, it is necessary to know the probability distribution of packet delays exceeding given values. In provisioning the input buffer it is important to know statistics to be able to determine probability of buffer overflow and underflow.

An original method to calculate statistics (and percentiles) of traversing time in Markov chains will be presented. Markov chains can be used to model the traffic in any network. They can model packet traffic in stored and forward networks like Internet; the parts moving across the production network; or patients moving through the health network. Conventionally the traversing time is given by the average values. However, the percentiles are of great importance. In Internet traffic, the percentiles of packet delay enable the architect to properly provision the receiving anti-jitter buffer. In production networks, percentile might indicate to the manufacturer the number of rejecting parts. Since the most powerful modeling tool – Petri nets – reduce to Markov chains, this method is applicable to the Petri nets as it will be shown in an example of alternating bit protocol. The importance of percentile calculation is stressed by the fact that reliable percentile figures are not possible to obtain by simulation or monitoring/measurement since they are rare events, and getting reliable figures requires very long time.

Speaker's Bio

Faruk Hadziomerovic received his B.Sc. from University of Zagreb, M.E.E. from the Netherlands University Foundation for International Cooperation (NUFFIC) in the Hague, and Ph.D. from University of Sarajevo, with the thesis "Multiprocessor-Multimemory Computer Based on Microprocessors". He spent a part of his career teaching at University of Sarajevo, Carleton University in Ottawa, Sarajevo School of Science and Technology, etc., and the other part in industrial research at the Institute for Control and Computer Sciences (IRCA), Sarajevo, Bell Northern Research (BNR) and Nortel Networks in Ottawa, and other companies in the telecommunication sector. His main teaching and research areas include microprocessors, operating systems, computer networks, and modeling for performance. His technical contributions are in the field of microprocessor hardware, network protocols and Petri nets.

Admission: Free. Registration required.

Please register by e-mail contacting: branslav@ieee.org.