

Network Simulation

This course is designed to introduce important theoretical concepts important in simulation of computer networks. Apart from the introduction of theoretical concepts, this course will focus on implementation of these concepts in standard simulators.

Synopsis:

Computer Networks are an integral part of any project, in which data or information needs to be transferred from one computing station to another computing station. Practically, it is not possible for every researcher to work on real hardware. So, we use tools to simulation computer networks. During simulation, we have to generate all those scenarios, which may occur when a network is in operation.

In this course, we will learn the concepts used in simulation of computer networks. These concepts include object orientation, random number generation, probability and statistics. We will focus on not only theoretical concepts but also on their implementation. Focus on implementation will be ensured by frequent programming assignments and a project. We will be using Matlab build r2008a or later for simulations as it has support for Object Oriented Programming.

Instructor

Dr. Syed Muhammad Khaliq-ur-Rahman Raazi is an Assistant Professor in Karachi Institute of Economics and Technology since April 2011. He received his PhD in Wireless Sensor Networks from Kyung Hee University, South Korea in 2010. Before that, he did his MS in Computer Science from LUMS and BE in Computer Software from NUST. In addition to that, he has industry experience of a couple of years. His research interests include Ad Hoc Networks, Wireless Body Area Networks, Content-Based Communication and Ubiquitous Computing.

Course Outline

- Network Entity Classes & Objects
- Simulation Options & Result Compilation
- Data Structures & Prog. Concepts
- Time Slicing & Event Scheduling
- Probability & Random Variables
- Commonly used probability distributions
- Random Numbers & Random Variates
- Queuing & Scheduling

Books

Materials in this course are collected from various sources. However, following books will prove to be useful:

1. Jerry Banks, John S. Carson II, Barry L. Nelson, David M. Nicol, O. Shahabudeen, "Discrete-Event System Simulation", Fourth Edition

