Performance Evaluation of Computer Systems

Dr. Ahmad Khonsari

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Teaching Staff

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Course Goals

- Measurement techniques and tools
- Review the principles of probability
  - Review probability theory
  - Laplace and Z transform
  - Bounds (Union Bound,...)
  - Inequalities: Chebyshev, Chernoff, ...
  - Limit law
  - Sequence of random variables
  - Discrete time Markov Chain
  - Continuous time Markov Chain
  - Poisson process, PASTA
- Queuing Theory
  - Little law
  - M/M/1 Queueing system
  - M/G/1 Queueing systems
- Learn the simulation basics and techniques

Course Format

- **Self-read lectures**

- **Homework Assignments**
  - All Exercises **must** be typed with LaTex.
  - Upload tex files + PDF version.

- **Computer Assignments**
  - Short reports are required, written via Latex.
  - Use a **Jupyter Notebook** (Microsoft Azure Notebook) to show your python, R codes and also your reports.

- **Quiz(zes) and Exam(s)**

- **Final Project**

Grading Plan

- 20% for Homework Assignments

- 30% for Computer Assignments and Projects

- 50% Exams and Quizzes

Submission Rules

- All assignments (class/homework/computer assignment & projects) have a hard deadline.

- With 72 extra hours for submission, but you may lose up to 15% of the assignment point based on your uploading date.

- You may get extra credit doing extra work on your projects or assignments.

- Copying is not acceptable. Any detected fraud leads to a ZERO point.

Course Material

- **Textbook:**
  - Introduction to Probability, by Dimitri Bertsekas and John Tsitsiklis, 2nd Edition.

- **Further reading**
  - Simulation Modeling and Analysis, by Averill M. Law.
  - Performance Modeling and Design of Computer Systems: Queueing Theory in Action, by Harchol-Balter.
  - System Modeling and Analysis: Foundations of System Performance Evaluation, by Kobayashi.
  - The Art of Computer Systems Performance Analysis: Techniques for Experimental Design, Measurement, Simulation, and Modeling, by Jain.