On the use of generating functions for computations in Markov chains with binomial transitions and applications in queueing and population growth models

Antonis Economou
National and Kapodistrian University of Athens, Department of Mathematics
aeconom@math.uoa.gr

Generating functions constitute a powerful tool for the effective computation of performance measures associated with Markov chains that occur in several fields, most notably in Queueing Theory and Stochastic Population Growth Models.

In the present talk, we will present various families of queueing and population growth models that are represented as Markov chains that encompass some kinds of binomial transitions. We will apply the generating function approach and will study the equations that govern the corresponding generating functions. We will then discuss how these equations can help in deducing exact formulas, recursive schemes, approximations and limiting results for the various performance descriptors.