

*Department of Mathematics,
University of California San Diego*

Probability Seminar

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A rate balance principle and its application to queueing models

Abstract:

We introduce a rate balance principle for general (not necessarily Markovian) stochastic processes. Special attention is given to processes with birth and death like transitions, for which it is shown that for any state i , the rate of two consecutive transitions from i to $i+1$, coincides with the corresponding rate from $i+1$ to i . This observation appears to be useful in deriving well-known, as well as new, results for the $M_n/G_n/1$ and $G/M_n/1$ queueing systems, such as a recursion on the conditional distributions of the residual service times (in the former model) and of the residual inter-arrival times (in the latter one), given the queue length. The talk is based on B. Oz, I Adan and M. Haviv, "A rate balance principle and its application to queueing models," *Queueing Systems: Theory and Applications*, 87, 95-111 (2017).

Host: Ruth Williams

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