

Oberseminar Mathematische Stochastik

Mittwoch, 7. Dezember 2016, 17:00 Uhr, SRZ 117

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Studies in Improper Markov Renewal Equations, with Applications to Computer Reliability Problems

Abstract:

A task like the transmission of a file or the execution of a computer program may fail and then need to be restarted. A problem of particular interest in that connection is the tail of the total execution time.

We consider such problems in complex systems incorporating features from classical reliability models. Markov renewal equations

$$Z_i(x) = z_i(x) + \sum_{j \in E} \int_0^x Z_j(x-y) F_{ij}(dy)$$

then become a main tool in the analysis. The key parameter determining the asymptotics is the spectral radius ρ of the matrix \mathbf{P} with ij th element $\|F_{ij}\|$. For the case $\rho \neq 1$, we present 1) an asymptotic expression for the analogue of γ when \mathbf{P} is almost a transition matrix and 2) a Markov renewal version of a 2003 result by Asmussen, Foss & Korshunov covering heavy-tailed F_{ij} (as there, the concept of local subexponentiality plays a main role).

Joint work with Lester Lipsky, Steven Thompson and Julie Thørgersen