

1067-60-295

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We consider a feedforward network with a preemptive service discipline, serving jobs with multiple levels of priority. In the special case where jobs have two different priority levels, we use tools from the theory of large deviations to explicitly identify the exponential decay rate of the total population overflow probabilities. We then construct asymptotically optimal importance sampling schemes to estimate the exact probability of interest. (Received August 17, 2010)