THE DEVIATION MATRIX OF A CONTINUOUS-TIME MARKOV CHAIN

Abstract: The deviation matrix of an ergodic, continuous-time Markov chain with transition probability matrix $P(.)$ and ergodic matrix Π is the matrix $D \equiv \int_0^\infty (P(t) - \Pi)dt$. We give conditions for D to exist and discuss properties and a representation of D. The deviation matrix of a birth-death process is investigated in detail. We also describe a new application of deviation matrices by showing that a measure for the convergence to stationarity of a stochastically increasing Markov chain can be expressed in terms of the elements of the deviation matrix of the chain.

Short title: The deviation matrix of a Markov chain