

ONLINE OPTIMIZATION OF PRODUCT-FORM NETWORKS

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We have developed an online algorithm for optimizing product-form networks through adjustment of system parameters. The algorithm circumvents difficult exact calculations of stationary distributions by measuring empirical frequencies. In essence, the algorithm implements stochastic gradient descent to minimize an objective function, basing decisions on observations of the underlying stochastic process.

There is considerable flexibility in choosing step sizes, lengths of observation periods, types of gradients and objective functions. In order to ensure good performance of the algorithm, it is essential to identify conditions for almost sure convergence to the optimal parameters. We discuss how mixing time results for product-form networks can be exploited to gain insight in these convergence issues.