

CONCENTRATION OF PERMANENT ESTIMATORS FOR CERTAIN LARGE MATRICES

B. Rider

Department of Mathematics
Duke University

Abstract We examine a polynomial-time stochastic algorithm to estimate the permanent of a given matrix. In particular, let $A_n = (a_{ij})_{i,j=1}^n$ be an $n \times n$ positive matrix with entries in $[a, b]$, $0 < a \leq b$, and let $X_n = (\sqrt{a_{ij}}x_{ij})_{i,j=1}^n$ be a random matrix where $\{x_{ij}\}$ are i.i.d. $N(0, 1)$ random variables. We show that for large n , $\det(X_n^T X_n)$ concentrates sharply at the permanent of A_n , in the sense that $n^{-1} \log(\det(X_n^T X_n)/\text{per } A_n) \xrightarrow{n \rightarrow \infty} 0$ in probability.