

情報電子工学科 論文発表

題名	Effects of Numerical Errors on Sample Mahalanobis Distances
掲載雑誌	IEICE TRANSACTIONS on Information and Systems, Vol. E99-D No.5, pp.1337-1344 (2016)
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概要	The numerical error of a sample Mahalanobis distance ($T^2=y'S^{-1}y$) with sample covariance matrix S is investigated. It is found that in order to suppress the numerical error of T^2 , the following conditions need to be satisfied. First, the reciprocal square root of the condition number of S should be larger than the relative error of calculating floating-point real-number variables. The second proposed condition is based on the relative error of the observed sample vector y in T^2 . If the relative error of y is larger than the relative error of the real-number variables, the former governs the numerical error of T^2 . Numerical experiments are conducted to show that the numerical error of T^2 can be suppressed if the two above-mentioned conditions are satisfied.
関連URL	http://doi.org/10.1587/transinf.2015EDP7348