ESTIMATION OF A COMMON MULTIVARIATE NORMAL MEAN VECTOR

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Abstract. Let $X_1, \ldots, X_N$ be independent observations from $N_p(\mu, \Sigma_1)$ and $Y_1, \ldots, Y_N$ be independent observations from $N_p(\mu, \Sigma_2)$. Assume that X_i's and Y_i's are independent. An unbiased estimator of μ which dominates the sample mean $\bar{X}$ for $p \geq 1$ under the loss function $L(\mu, \hat{\mu}) = (\hat{\mu} - \mu)'\Sigma_1^{-1}(\hat{\mu} - \mu)$ is suggested. The exact risk (under L) of the new estimator is also evaluated.

Key words and phrases: Common mean vector, unbiased estimator, Wishart and noncentral Wishart distributions.