Measurement error model for correlation coefficient estimation

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Introduction

The MeasurementError.cor package fits a two-stage measurement error model for estimating correlation between two random variables under bivariate normality. Its application is perhaps most relevant for the gene expression data where both point and standard estimates are available. We have shown that the proposed measurement error corrected correlation estimate has lower bias compared with the usual sample pearson correlation. For details, refer to Ding and Gentleman (2003) as well as R help pages associated with each function.

The cor.me.vector and cor.me.matrix functions

The cor.me.vector calculates the measurement error model estimate of correlation between two observed vectors whereas cor.me.matrix calculates all pairwise measurement error model estimate of correlation in the matrix.

> library(MeasurementError.cor)
> exp <- matrix(abs(rnorm(100, 1000, 20)), ncol = 10)
> se <- matrix(abs(rnorm(100, 50, 5)), ncol = 10)
> cor.me.vector(exp[1, ], se[1, ], exp[2, ], se[2, ])

$estimate
  corr.me  corr.true  mu1  mu2  s1  s2
-0.8711085 -0.7998043 999.9514070 994.6490727 0.6805626 0.2870322
the quantity of interest, i.e. the model estimate of the correlation between
the true value of two random variables whereas \texttt{cor.me} is the model es-
timate of correlation between the measurement errors of the two random
variables. The second quantity may not be of interest. \texttt{mu1}, \texttt{mu2} and \texttt{s1}, \texttt{s2}
are the estimated mean and standard deviation of the two random variables.
\texttt{cor.me.matrix} only returns the estimated correlation matrix.
References