Measurement error model for correlation coefficient estimation

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October 17, 2016

Introduction

The MeasurementError.cor package fits a two-stage measurement error model for estimating correlation between two random variables under bivariate normality. It's 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.

```r
> 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
0.8917019  0.6141045 998.4758550 1001.4153712 0.2973264  1.6647961
```
the quantity of interest, i.e. the model estimate of the correlation between the true value of two random variables whereas cor.me is the model estimate of correlation between the measurement errors of the two random variables. The second quantity may not be of interest. mu1, mu2 and s1, s2 are the estimated mean and standard deviation of the two random variables.
cor.me.matrix only returns the estimated correlation matrix.

References