

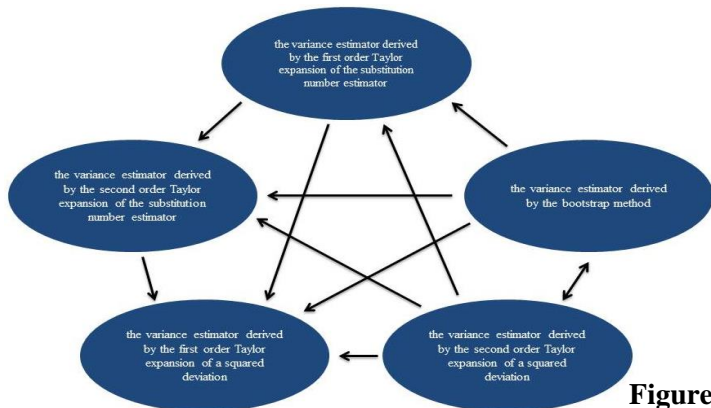
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Industrial Statistics, Bioinformatics

MicroRNA Studies: MicroRNAs (miRNAs) are small RNAs with important functions in development, cell differentiation, regulation of cell cycle and apoptosis. Many studies have now shown that miRNAs are involved in the initiation and progression of cancers. Procedures based on the relative R-squared method (RRSM) are proposed to investigate miRNA-mRNA regulatory relationships (Figure 1).

Nucleotide Substitution Model: The estimation of the nucleotide substitution number is an important topic for variance estimators of most evolution models. The researchers derive three variance estimators for the F81, F84, HKY85 and TN93 nucleotide substitution models, respectively (Figure 2).

Control chart: Multivariate control charts are useful tools in detecting shifts in a manufacturing process when the quality characteristics of interest are multivariate. We propose charts for monitoring μ by modifying several well-known conventional charts by replacing the sample mean with the James-Stein estimator.



A \leftrightarrow B : Two estimators have a similar performance
 A \rightarrow B : A has better performance than B

Figure 2.
The relationships of five variance estimators for the substitution model

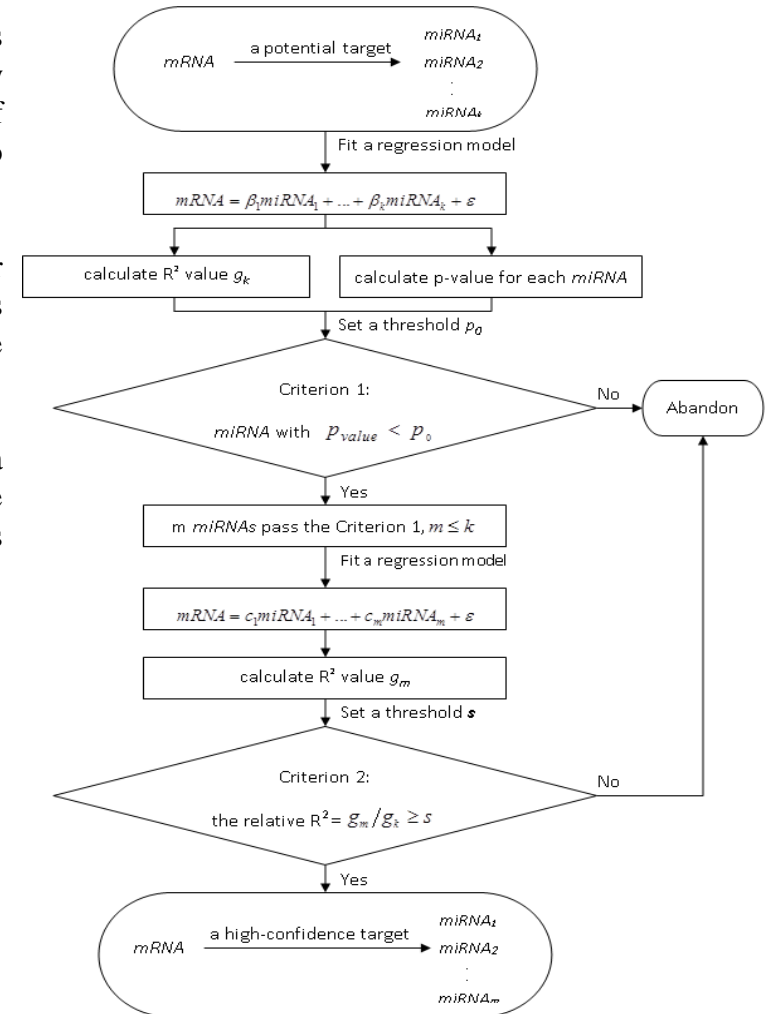


Figure 1. The flowchart of the procedure for RRS