

The Langston Lab Releases EntropyExplorer, an R Package for Calculating Differential Shannon Entropy and Differential Coefficient of Variation

Background: Differential Shannon entropy (DSE) and differential coefficient of variation (DCV) are effective metrics for the study of gene expression data. They can serve to augment differential expression (DE), and can be applied in numerous settings whenever one seeks to measure differences in variability rather than mere differences in magnitude. A general purpose, easily accessible tool for DSE and DCV would help make these two metrics available to data scientists. Automated p-value computations would additionally be useful, and are often easier to interpret than raw test statistic values alone.

Results: *EntropyExplorer* is an R package for calculating DSE, DCV and DE. It also computes corresponding p-values for each metric. All features are available through a single R function call. Based on extensive investigations in the literature, the Fligner-Killeen test was chosen to compute DCV p-values. No standard method was found to be appropriate for DSE, and so permutation testing is used to calculate DSE p-values.

Conclusions: *EntropyExplorer* provides a convenient resource for calculating DSE, DCV, DE and associated p-values. The package and its source code are available at <http://cran.r-project.org/web/packages/EntropyExplorer/index.html>.

Link: <http://cran.us.r-project.org/web/packages/EntropyExplorer/index.html>