

Residual diagnostic tools for multivariate normality

In ecology, as elsewhere, multivariate normality is often assumed in analyses, but few effective graphical diagnostic tools exist to query this assumption. In this talk a new approach is developed that exploits two well-known ideas: that (under quite general conditions) full conditional distributions are diagnostic of a joint distribution; and that under multivariate normality, the full conditional for each response follows a linear regression model conditional on all other responses. Hence a simple graphical tool to diagnose multivariate normality can be constructed via standard linear regression diagnostics, regressing each response against all others. The idea will be illustrated using the classical Iris dataset, and simulations evaluating the technique will be reported. Software implementing the technique is available on R in the `ecostats` package.