Einladung zum Biometrischen Kolloquium

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THE DISTANCE CORRELATION COEFFICIENT FOR RIGHT-CENSORED SURVIVAL DATA

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ABSTRACT:

Székely, Rizzo, and Bakirov introduced the powerful concept of distance correlation as a measure of dependence between random variables. In contrast to Pearson correlation, which only measures linear dependence, distance correlation can detect any kind of dependence including nonlinear or even nonmonotone associations.

In biomedical applications, one is interested in finding associations between patient characteristics (e.g. the expression of a certain gene) and survival time. This kind of data usually involves right-censoring, implying that the exact survival time cannot be observed for individuals who leave the study before they decease. Under this missingness of information, it is not straightforward to derive consistent estimates for the distance correlation.

In this talk, we present a suitable distance correlation coefficient for right-censored survival data accounting for censored observations via inverse probability of censoring weights (IPCW). In particular, we show that the population distance correlation between covariate data and survival times can be approximated by an IPC-weighted U-statistic. Using a simulation study, we demonstrate that this coefficient is helpful to reveal associations which cannot be found with standard methods. Finally, we apply this coefficient on variable screening for ultrahigh dimensional DNA methylation data.