One-Parameter Allele-Sharing Models: Linear and Exponential Tilting

HEPING HE

Abstract

Nonparametric linkage (abbreviated as NPL) score statistic based on allele-sharing is introduced in Kruglyak et. al. (1996), but it is fairly conservative in testing linkage, especially for the strongly imperfect data. To ovecome the conservativeness, Kong et. al. (1997) presents the one-parameter model (linear tilting model) for which Likelihood ratio test statistic can be applied to test linkage. However, the parameter in linear tilting model has a upper bound; if the maximum likelihood estimator of the parameter is close to the bound, the model is also conservative. Therefore Kong et. al. (1997) proposes the exponential tilting model which has no bound problems. It is believed that exponential tilting model is more accurate than linear tilting model, which is more accurate than NPL score, in p-value calculations. A sort of theoretical proof/argument is given that exponential tilting model is more accurate than NPL score in p-value calculations. The theoretical argument that exponential tilting model is more accurate than linear tilting model, and linear tilting model is more accurate than NPL score in p-value calculations, may be given in the similar ways.

REFERENCES

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