

(7) The Non - parametric Bootstrap Resampling for Visual Acuity Measurement

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【要 旨】

We propose the non-parametric bootstrap resampling for the problem of psychophysical threshold estimates. The logistic regression with guessing rate and formulation of deviance residuals are in sections 2 and 3. The log-likelihood ratio test statistics is shown in section 4, and the non-parametric bootstrap resampling and testing of hypothesis are in sections 5 and 6. Finally, in section 7 we present an application of our algorithm to psychophysical threshold estimates in the visual acuity test.

Main properties of the algorithm are summarized in the following:

- (i) the logistic regression including the guessing rate,
- (ii) the non-parametric bootstrap resampling with log-likelihood ratio statistics for two-sample testing,
- (iii) the non-parametric bootstrap resampling

for one-sample testing to certify the values of parameters and threshold obtained by logistic regression.

We applied our bootstrap algorithm to the visual acuity test problem. The algorithm does not require the identity of the number of observations between two samples. We can say that the bootstrap resampling provides a useful tool which has the flexibility of sampling in actual visual acuity measurements.

References

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