

國立中山大學應用數學系

學術演講

講者：Professor Jaromír Antoch

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講題：Nonparametric Comparison of ROC Curves
and Application to Linguistics

時間：2014/06/12（星期四）14：10～15：00

地點：理學院四樓理 SC 4009-1 室

茶會：16:00 於理 SC 4010 室（系辦公室）

摘要

Receiver operating characteristic (ROC) curves are a popular and widely used tools that can help to summarize the overall performance of diagnostic methods and/or classifiers assigning individuals into one of two groups. Several methods exist for testing the equivalence of two ROC curves. The most widely used current approaches are based on the area under the curve, on a permutation principle or are directly connected to the binormal ROC curves and their transformations. Unfortunately, in practice it is usual that we do not have any a priori information about the form of the underlying distribution, we often deal with curves possibly crossing each other, or have available large sample sizes and especially large numbers of considered ROC curves. All these situations disqualify the use of the classical methods and motivated us to suggest a new test of equivalence of two ROC curves.

Therefore, in the first part of the lecture the problem of testing equivalence of two ROC curves will be addressed. A transformation of corresponding ROC curves, which motivates a test statistic of a von Mises type based on a distance of two empirical quantile processes, will be suggested, its asymptotic distribution presented and a simulation scheme that enables to find critical values proposed.

Second part of the lecture will focus on combining association measures using corresponding ROC curves. The approach is motivated by a problem of automatic bigram collocation extraction from the field of computational linguistics. It is based on supervised machine learning techniques and the fact that different association measures discover different collocation types. Basic idea is that the clusters of equivalent ROC curves are first determined by a ROC testing procedure. The major contribution is an investigation of the possibility of combining representatives of the clusters of equivalent association measures into more complex models, thus improving performance of the collocation extraction.

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