

Please join the virtual Biometric Colloquium

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BIOMARKER IDENTIFICATION WITH PENALIZED REGRESSION IN THE PRESENCE OF HIGH-DIMENSIONAL DATA

April 27th, 2022 at 9:00 am

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<https://meduniwien.webex.com/meduniwien/j.php?MTID=m8c26927ec9c505f4c94fb16f7a430024>

HOST: Georg Heinze

ABSTRACT

In clinical trials, identification of prognostic and predictive biomarkers is essential to precision medicine. Prognostic biomarkers can be useful for the prevention of the occurrence of the disease, and predictive biomarkers can be used to identify patients with potential benefit from the treatment. Previous research mainly focused on clinical characteristics, and the use of genomic data in such an area is hardly studied. A new method is required to simultaneously select prognostic and predictive biomarkers in high dimensional genomic data where biomarkers are highly correlated. We propose novel approaches WLasso (Whitening Lasso) for prognostic biomarker identification, and PPLasso (Prognostic Predictive Lasso) that integrates prognostic and predictive effects into one statistical model as a variable selection problem in an ANCOVA (Analysis of Covariance) type model. WLasso and PPLasso take into account the correlations between biomarkers that can alter the biomarker selection accuracy. In a comprehensive numerical evaluation, we show that they outperform the traditional Lasso approach in various scenarios.