

SZEMINÁRIUM

Az ELTE TTK Valószínűségelméleti és Statisztika Tanszékének
szemináriumán 2015. június 5-én, pénteken 10 órakor

Marco Marozzi (Università della Calabria, Olaszország)

*Multivariate multidistance tests for high-dimensional low sample size
case-control studies*

címmel tart előadást.

Az előadás helye: ELTE lágymányosi campus, déli épület (1117 Budapest,
Pázmány Péter s. 1/C), 3-316.

Kivonat: A class of multivariate tests for case-control studies with high dimensional low sample size data and with complex dependence structure, that are common in medical imaging and molecular biology, is presented. The tests can be applied when the number of variables is much larger than the number of subjects, and when the underlying population distributions are heavy-tailed or skewed. As a motivating application, we consider a case-control study where phase contrast cinematic cardiovascular magnetic resonance imaging has been used to compare many cardiovascular characteristics of young healthy smokers and young healthy non-smokers.

The tests are based on the combination of tests based on interpoint distances. It is theoretically proved that the tests are exact, unbiased and consistent. It is shown that the tests are very powerful under normal, heavy-tailed and skewed distributions. The tests can be applied also to case-control studies with high-dimensional low sample size data from other medical imaging techniques (like computed tomography or X-ray radiography), chemometrics and microarray data (proteomics, transcriptomics).

Hivatkozások

- [1] Jureckova, J, Kalina, J. Nonparametric multivariate rank tests and their unbiasedness. *Bernoulli* (2012), 18:229–251. DOI: 10.3150/10-BEJ326

- [2] Marozzi, M. Multivariate tri-aspect non-parametric testing. *Journal of Nonparametric Statistics* (2007), 19:269–282. DOI: 10.1080/10485250701768537
- [3] Marozzi, M. Multivariate tests based on interpoint distances with application to magnetic resonance imaging. *Statistical Methods in Medical Research* (2014), DOI: 10.1177/0962280214529104
- [4] Marozzi, M. Multivariate multidistance tests for high-dimensional low sample size case- control studies. *Statistics in Medicine* (2015), DOI: 10.1002/sim.6418