Ute Hahn

Graphical goodness-of-fit and ANOVA tests for functional data

Joint with Tomáš Mrkvička, Mari Myllymäki, Pavel Grabarnik

An exact graphical Monte Carlo goodness-of-fit test for functional data will be introduced. Observed data are compared to simulated counterparts by way of a simultaneous acceptance region, the *global envelope*. The test rejects when the observed curve leaves the envelope, thus making it possible to see where the observed function disagrees with the null hypothesis.

The global envelope is calculated on the base of pointwise ranks of the functions evaluated in finitely many arguments. It is essentially a test for vectors, and can therefore be applied to any kind of high dimensional data, including images. Due to its construction, the envelope test yields an interval for the p-value. As a solution to obtain a unique p-value, I will present the rank count test, aka *gold first* method.

For comparison of groups, simulations are replaced by permutation. This opens various ways to testing equality of group means, including direct comparison of group means to overall mean, or multiple pairwise contrasts.