

POZVÁNKA na SEMINÁŘ

v úterý 18. listopadu v 13:30
v posluchárně č. 5.068 v budově PřF UPOL, 17. listopadu č. 12.

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Continuous-time multivariate analysis

Abstract: The starting point for much of multivariate analysis (MVA) is an $n \times p$ data matrix whose n rows represent observations and whose p columns represent variables. Some multivariate data sets, however, may be best conceptualized not as n discrete p -variate observations, but as p curves or functions defined on a common time interval. Here we introduce a framework for extending techniques of multivariate analysis to such settings. The proposed continuous-time multivariate analysis (CTMVA) framework rests on the assumption that the curves can be represented as linear combinations of basis functions such as B-splines, as in the Ramsay-Silverman representation of functional data; but whereas functional data analysis extends MVA to the case of observations that are curves rather than vectors — heuristically, $n \times p$ data with $n \times p$ infinite — we are instead concerned with what happens when n is infinite. We outline continuous-time extensions of the classical MVA methods of covariance and correlation estimation, principal component analysis, Fisher's linear discriminant analysis, k-means clustering and multidimensional scaling. We show that CTMVA can improve on the performance of classical MVA, in particular for correlation estimation and clustering, and can be applied in some settings where classical MVA cannot, including variables observed at disparate time points. CTMVA is illustrated with a novel perspective on a well-known Canadian weather data set, and with applications to data sets involving international development, air quality, and the texts of political speeches. The proposed methods are implemented in the publicly available R package "ctmva".

K účasti jsou zváni jak členové katedry, tak všichni učitelé, vědečtí pracovníci
a studenti, kteří mají o problematiku zájem.

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