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on Fuzzy Set Theory and Applications

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ABSTRACTS

January 30 – February 3, 2012

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ORGANIZERS

THE ELEVENTH INTERNATIONAL CONFERENCE ON FUZZY SET THEORY AND APPLICATIONS WILL TAKE PLACE UNDER THE AUSPICES OF THE FOLLOWING INSTITUTIONS:

FACULTY OF CIVIL ENGINEERING
OF THE SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA

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Aggregation and portfolio diversification

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Aggregation of distributions is an important problem not only for mathematicians, but it also plays an important role in portfolio management or in economic risk capital analysis. It is based on a convolution integral whereby we derive the distribution of a sum of random variables from the marginal distribution of the variables and copula. The purpose of this paper is to show how to aggregate two random variables X_1 and X_2 with their marginal densities and using normal and normal mixture copula. Having obtained the aggregate distribution, i.e. the distribution of the sum of several random variables, it is a straightforward matter to estimate the standard deviation (or volatility), or to find lower percentile of the aggregate distribution for estimating VaR (Value at Risk) of the portfolio.

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A note to stochastic processes

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Our contribution will be devoted to comparison of a generalized linear regression (where a covariance matrix Σ with correlated measurements is considered) with a quantum approach to linear regression, and an AR-process is compared with its quantum version. We will be interested in the quality of predictions computed using the corresponding classical and quantum methods. When we consider a time series, it is quite natural to assume that an event occuring at a time instant t is independent of events happening later on at time instants $t + k$ for $k = 1, 2, .,$. Quantum models which have been developing on orthomodular lattices L (i.e., unions of Boolean algebras) enable to model causality. This means that the probability of occuring of events $a, b \in L$ might be influenced by their order. We may have $p(a, b) \neq p(b, a)$. We show a possibility how to add such causal (non-compatible) observables by introducing a summability operator.

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