

INVITATION LETTER

Dear colleagues,

We are pleased to inform you that, followed by the First International Econometric Conference of Vietnam (ECONVN2018) held on 15-16 January, 2018, the Institute of Research and Technology and Department of Mathematical Economics, Banking University of Ho Chi Minh City are organizing a series of seminars, the detailed schedules as follows:

On 20th of January, 2018, time: 9.00-12.00 and 14.00-16.00

Professor Nguyen Trung Hung , Department of Mathematics, New Mexico University, USA will give a talk with the title: **Quantum Probability for Behaviorial Econometrics.**

OUTLINE:

This is an introduction to a new uncertainty modeling suitable for human decision under risk in financial economics (affecting their current statistical models) as testified by the 2017 Nobel Memorial Prize in Economic Sciences, namely "Behavioral Economics" awarded to Robert Thaler. While Thaler's winning work was based on Prospect Theory (a non-additive probability approach), it lacks semantics and non commutativity of events. We propose to use quantum probability (which has a clear semantics/ just ordinary frequentist interpretation of chance) and yet, it is non commutative and hence also non additive. This approach will enhance behavioral economic studies. Research issues will be discussed, for financial econometrics applications as well as for mathematical research. The theory of quantum probability (borrowed from the successful quantum mechanics) will be given in a tutorial manner with HANDOUTS (a complete set of Lecture Notes of 350 pages).

On 21th of January, 2018, time: 9.00-12.00 and 14.00 -16.00

Professor Vilem Novak and Professor Irina Perfilieva, Institute for Research and Applications of Fuzzy Modeling, University of Ostrava, Czech Republic will give a talk with the title: **Fuzzy Models in Data-Driven Decision Making in Economics.**

OUTLINE:

Economical models can be roughly characterized as mathematical and empirical. The latter class of models involves mathematical apparatus that is not derived from physical processes, but from analysis of time series data. Examples include linear regression and ARIMA models. Recent developments in computational intelligence, in the area of machine learning in particular, have greatly expanded the capabilities of empirical modeling. The field which encompasses these new approaches is called datadriven modeling (DDM). The DDM is based on analyzing the data about a system without explicit knowledge of the physical behavior of the system. The methods include contributions from artificial intelligence, soft computing with special emphasis on fuzzy rule-based systems, machine learning and data mining. In the tutorial, we give a detailed introduction to the most powerful fuzzy techniques as F-transforms (they successfully connects fuzzy and conventional kernel-based models) and methods of fuzzy natural logic. First, we will show that the technique of F-transform fully agrees with the technique of dimensionality reduction based on Laplacian eigenmaps. To justify this claim, we characterize the data processed by the F-transform in terms of the adjacency graph that reflects their (data) intrinsic geometry. In the second part, we give an overview of the F-transform applications to finance: we will discuss estimation of the

market volatility and the numerical scheme and solution to the one-factor Black-Scholes partial differential equation. In particular, the following topics will be discussed:

1. Fuzzy partition of a universe and its geometry
 2. Generic problem of dimensionality reduction
 3. Higher degree fuzzy (F-)transform and orthogonal projection on Hilbert spaces
 4. Dimensionality Reduction by the F-transform
 5. F-transforms in Mathematical Finance:
 - Estimation of Market Volatility
 - F-transform based solution of ordinary differential equations and modeling Option Pricing
- Second, we will introduce some of the concepts of fuzzy natural logic that will be later used in the applications to economic modeling. The leading role have the, so called, evaluative linguistic expressions (for example, small, very expensive, extremely large, rather big, etc.). Such expressions are used whenever we need to estimate quality of results, characterize some process, investment, etc.) and, therefore, they are widely used in economical practice. In particular, we will discuss the following topics:
- a. Basic concepts of fuzzy set theory.
 - b. The concepts of modus ponens, fuzzy IF-THEN rule and linguistic description.
 - c. The model of the semantics of evaluative linguistic expressions.
 - d. Perception-based logical deduction.
 - e. Application of fuzzy natural logic to managerial decision-making.
 - f. Application of F-transform and fuzzy natural logic to processing and forecasting of time series and mining information from them.

Location: 36 Ton That Dam, Nguyen Thai Binh Ward, District 1, Ho Chi Minh City.
Contact: Dr. Nguyen Minh Hai, phone number: 0916132429.

It would be our great honour if you can come to attend this seminar.
We are eagerly awaiting you participation in our seminars!

Best regards,



Prof. Ly Hoang Anh
President of Banking University of Ho Chi Minh City