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Physics Procedia 3 (2010) 1621–1629

Physics Procedia

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2009 China-EU Summer School at Chengdu, Emei, China has been a successful event, enhancing the already strong scientific exchange in Complexity Science. First of all, we want to express gratitude to all the sponsors who made this exciting school possible and to all the lecturers for their exciting expositions and all the participants for making the exchange of ideas such a lively experience. About 200 people participated to this event, the first part of basic lectures was held at the UESTC campus where we got logistics support and assistance from many student volunteers who tried in every way to make the School a success.

Since 2006 the first workshop between EU and China scientists in Turin, Italy, we have decided to hold the yearly Summer School. Sometimes this will be in Europe, like in Italy and Warsaw, (2008), other times in Beijing (2007), and in the near future in Shanghai (2010). As a result of this series of schools, there are many examples of scientific collaboration initiated on the both sides, multiple visits and joint scientific projects start to enhance the effect of these summer schools. We find that the best way to stimulate the complexity science research in China and Europe is to expose most recent ideas to young researchers and students and this will be our policy for a long time.

There are thirteen contributed papers studying econophysics topics [1, 2]. Six papers investigated the statistical properties of financial markets and economic systems. Mu et al. [3] studied the temporal correlations and multifractal nature of trading volumes of 22 liquid stocks traded on the Shenzhen Stock Exchange in 2003 and confirmed the presence of long memory and multifractality in the trading volumes. Sun et al. [4] investigated the probability distributions of trade numbers and trading volumes of 52 Chinese stocks and found that they were well within the Levy regime. Zhang et al. [5] investiagted the topological properties of the networks constructed from financial time series based on time-delayed segment correlations [6, 7]. Three papers from Y.-G. Wang's group [8-10] dealt with money mobility, which is a significant topic in economics [11]. Wang et al. [12] presented the relation between Keynesian multiplier and the velocity of money circulation in a money exchange model. Xu et al. [9] reported that the world income distribution expressed in terms of GDP per capita invariably scales down as an exponential law and visualized the dynamical characteristics behind this macro-stability using a clock form. Peng et al. [11] proposed a measure for money mobility in

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doi:10.1016/j.phpro.2010.07.002

the vector space, which highlights future quantitative research in this direction.

Five papers discussed the models of financial markets and economies. Based on the log-periodic power-law model [12], Yan et al. [13] studied new methods for the diagnosis and prediction of turning points of crashes and rebounds in financial markets. Yu et al. [14] presented and investigated an industrial transferring macroeconomic model where credit-constrained agents may invest projects of different industries. Deng et al. [15] proposed an interesting agent-based model with depositor imitations for bank runs and studied depositors' strategies, which is helpful to the understanding of economic crisis from the view points of agent-based modeling [16] and agent interactions [17]. Quan and Zhu [18] investigated the behaviors of imitating agents in an evolutionary minority game on Newman-Watts small world networks and Yang et al. [19] studied the effect of local information on the dynamics of a mixed minority game, both of which contributed to the topic of minority games [20].

The two remaining econophysics papers concern with general methods. MaCauley [21] studied NonMarkov Ito processes with 1-state memory, which is quite intriguing and relevant to the famous Black-Scholes option pricing model [22]. Liu and He [23] investigated the KSS unit-root test of nonlinearity and nonstationarity of agricultural futures prices and cast doubts on the results based on linear hypothesis.

More than one third contributed papers studied the structure and function of complex networks. Six papers considered the structure and evolution of complex networks. Shi *et al.* [24] introduced a vector Markov chain of the number of nodes with degree k in the network growing process, and accordingly proved the stability of the Barabasi-Albert model [25]. Again based on a Markov chain analysis, Shi *et al.* [26] provided a concept of time-dependent scale-free networks, and proved the criteria for the stability and scale-free property of growing networks. Their works contribute to the more strict characterization of complex networks, which are considered to be very significant by mathematicians [27]. Zhang [28] reviewed the network models of the entangled polymer melts. Liu *et al.* [29] provided an interesting economic analysis on the Chinese city airline network [30], which implies that the tertiary industry value plays the most important role in determining the

network construction and the passenger load of each airline. Guo and Wang [31] commented on the analytical result of the degree distribution of Apollonian networks [32], and provided both the analysis and simulation for a corrected result. Motivated by the *fit-get-richer* mechanism [33] and the mutual selection rule [34], Xu *et al.* [35] proposed a mutual selection model based on the intrinsic fitnesses of nodes, which can produce the power-law degree distribution provided a properly chosen selecting function.

Nine papers studied the dynamics taking place on complex networks. Gao and Hua [36] investigated a susceptible-infected-refractory-susceptible (SIRS) model [37] in the Watts-Strogatz small-word networks [38], and found that a long immunity period plays an important role in the emergence of the global oscillation. According to a growing geographical network model [39], Sun *et al.* [40] studied the geographical effects of a susceptible-infected-susceptible (SIS) model [41]. Wang and Zhu [42] modeled the worm spreading in the ad hoc communication network on a two-dimensional triangular lattice. They found that the medium access control mechanism increases the threshold of epidemics and reduces the prevalence of infected nodes in the network. Xia *et al.* [43] proposed a SIS model with mobile agents, which can be analytically solved by the mean-field theory if the agents jump in a random manner. Recently, several efficient methods on solving the threshold of epidemic spreading on heterogeneous networks were proposed. Zhang and Wang [44] briefly reviewed the typical methods, including the mean-field approximation, the percolation method, the Markov process analysis and the matrix approach. Yang [45] studied the Blume-Emery-Griffiths (BEG) dynamics [46] on a social network model [47]. Chen *et al.* [48] studied an extension of the prisoner's dilemma game (PDG) [49], which allows not only the cooperating and defecting strategies, but also the third choice, to refuse to participate. Liu *et al.* [50] considered another extension to the PDG, where the fitness of each player is composed of the instantaneous payoff from the interactions and the inherited fitness from the last generation. Yang and Wang [51] investigated the role of social diversity on the evolutionary public good game (PGG) [52]. A kind of optimal level of diversity was revealed by numerical simulation subject to the cooperation strength.

Besides the mainstream interests in econophysics and complex networks, there are also a considerable number of papers contributed to some other branches of interdisciplinary physics and complexity sciences, including the

infophysics, the human dynamics and the collective dynamics.

Infophysics is a neonatal domain of interdisciplinary physics, which utilizes the theories, approaches and perspectives of statistical physics to study the modern information systems. Pan *et al.* [53] proposed a personalized recommendation algorithm for a user-object bipartite network, which is a direct extension to the mass diffusion algorithm [54] via the consideration of edge weights. Wu and Zhang [55] proposed another weighted mass diffusion algorithm, where the weight of an user-object edge is determined by the tags that user assigned to that object. Although such weighting method can not improve the accuracy of recommendation, it largely enhances the diversity of recommendation, which is of the same significance as accuracy [56]. According to the standard collaborative filtering framework [57], Zhang *et al.* [58] compared eight local similarity indices on two data sets. To one's surprise, they found that the structure-based similarity indices overall outperform the correlation indices, especially when the data is very sparse. Since the computational cost of a structure-based index is cheaper than that of a correlation index, their finding is practically valuable, which is also a complementary result to a recent Letter [59].

Human dynamics aims at uncovering the temporal and spatial regularities of human activities [60, 61]. Chen et al. [62] analyzed the records of QQ instant messages of nine volunteers, and demonstrated the wide existence of non-Poissonian statistics, such as inter-event distributions of sending and receiving messages, communications between two friends, log-in activities, the distribution of online time, quantities of messages, and so on. Han and Wang [63] proposed a task-based model to mimic the walking process of human on a two-dimensional landscape, which reproduces the observed power-law-like displacement distribution.

Collective dynamics concerns the emergence of global order from an initially disorder system where each individual generally only interacts with local environment and neighbors. The emergent order can be the synchronization of some dynamical variables [64], the alignment of collective motions [65], and so on. Wu *et al.* [66] investigated the consensus problem for multi-agent systems and provided a valid decentralized consensus algorithm that overcomes the difficulties caused by nonlinearity and switching coupling topology. Yang *et al.* [67] studied the relations of the scale-free network

topology and the moving consensus of multi-agent systems. Jiang *et al.* [68] reviewed the recent progress of another very important collective dynamics, the formation of spatial patterns during the evolutionary games.

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