

Editor's Message to Special Issue on Network Science

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In the beginning of this century, it has been found that there is a common topological structure called scale-free in many real networks: social relationship of acquaintances or companies, technological infrastructures of Internet or powergrid, chains of biochemical reactions in gene or metabolic system, and so on. Unfortunately, the tolerance of connectivity in these networks are extremely vulnerable against intentional attacks. However, in order to analyze the complex network structure and the basic properties of disease or information spreading on it, several superior theories and efficient computational algorithms have been found and sequentially developed in this decade. In recent years, further directions are expanding not only to fundamental researches on network science but also to international strategic researches in US or EU to take steps appropriate for analysis of large social networks and serious problems of rapid breaking in the interdependent communication-powergrid-logistic networks against huge disasters of climate catastrophe and earthquakes or terrorist attacks.

Also, in our society of IPSJ, as NE: Network Ecology research group from 2005, we have continued to organize active research meetings and publishing proposals, e.g. "IPSJ journal special issue on Network Ecology Science" in March 2006 and "IPSJ MAGAZIN Spreading of Topics in Complex Network Science" in March 2008. Moreover, in the decade, the maturity of these research in network science is advanced more and more, and unpublished or ongoing research contents are stored.

Thus, we have organized this special issue in order to publish recent research activities or various development case-studies with respect to Network Science. In the submitted 19 papers, the accepted ones are 9 with the rate 0.47. However, in spite of including interesting contents, some papers were rejected due to special issue in the limited short term to revise each of them for reviewer's comments or suggestions. We expect to be progressed for them hereafter.

By this special issue, we have gathered good papers which give important suggestions for applications of human activities such as sympathy or message delivery in our daily social communities on information network, in addition to fundamental research on analyses for tomographic structure, robustness of connectivity, or disease spreading model.

On the other hand, while Network Science is one of the interdisciplinary research fields related to fractal statistical physics,

sociology, economics, algorithm, communication, machine learning, and so on, it will become furthermore important as a basis of common disciplinary platform for investigating our social infrastructures. In particular, it will be predicted that by using just like social score relations between business promotion and recommendation or imitative behavior on SNS become tighter, and affect to our daily life moreover. We emphasize that Network Science is necessary for analyzing them based on fundamental theories, and that it will be progressed in our IPSJ society with NE research group.

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