Mathematical Modeling of Small-Scale Local-Area Internet

Prof. Guanrong Chen  
*City University of Hong Kong, Hong Kong*

He received the MS degree in computer science from the Sun Yat-sen University, China, in 1981 and the Ph.D. degree in applied mathematics from Texas A&M University, USA, in 1987. Currently, he is a Chair Professor of Electronic Engineering and the Director of the Research Centre for Chaos and Complex Networks in the City University of Hong Kong. His research interests include nonlinear dynamics related to chaos and bifurcations, and complex networks related to modeling, dynamics and control.

Abstract

The current study of complex dynamical networks is pervading all kinds of sciences today, ranging from physical to biological, even to social sciences. Its impact on modern engineering and technology is prominent and will be far-reaching. Typical complex dynamical networks include the Internet, the World Wide Web, various wireless communication networks, metabolic networks, biological neural networks, social connection networks, scientific cooperation and citation networks, and so on. Research on fundamental properties and dynamical features of such complex networks has become overwhelming.

This talk will provide a brief introduction of our recent progress in modeling a small-scale local-area the Internet from a complex-network approach, using our “Multi-Local-World” (MLW) framework. Some representative and comparable models will be discussed and compared by using some real Internet data, which shows that our MLW model is the best among them in the sense that our model matches the real data more closely than the others. Some related model-robustness issues and a few future research topics along this line will finally be addressed.

References

