Network Controllability and its Robustness against Destructive Attacks

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This talk addresses the concerned issue of network controllability and its robustness against destructive node-removal or edge-removal attacks. The concept and criteria of network controllability are introduced, and a new snapback network model is constructed. Then, a quantitative measure of the robustness of network controllability is defined. Finally, an extensive empirical comparison on seven typical network models, namely, random-graph network, scale-free network, multiplex concurrence network, snapback network, re-directing snapback network, random triangle network, and random rectangle network, against six different types of attacks, that is, random and targeted, betweenness-based and degree-based node-removal and edge-removal attacks, showing the overall super-robustness of the multi-ring structure in complex networks.

About the Speaker

Prof Guanrong Chen received the M.Sc. degree in computational mathematics from Zhongshan University, China in 1981 and the PhD degree in applied mathematics from Texas A&M University, USA in 1987. He has been a Chair Professor at City University of Hong Kong, China since year 2000, prior to that he was a tenured Full Professor at the University of Houston, Texas, USA. Prof Chen was elected IEEE Fellow in 1997, and has been an ISI Highly Cited Researcher in Engineering since 2009. He received second prize of the State Natural Science Award of China in 2008, 2012 and 2016, respectively, and awarded the 2011 Euler Gold Medal, Russia. He was conferred Honorary Doctorates by the Saint Petersburg State University, Russia in 2011 and by the University of Normandy, France in 2014. He is a member of the Academy of Europe (2014) and a fellow of The World Academy of Sciences (2015).