中国科学院数学与系统科学研究院
Academy of Mathematics and Systems Science, CAS

图论组合与网络研究中心

Center for Graph Theory, Combinatorics & Networks

学术报告

题　　目：Zero-Error Distributed Function Compression
分布式零错函数压缩

报告人：光炫 教授（南开大学）

时　　间：5 月 25 日（星期四） 13:30-14:30， N620

摘　　要：In this talk, we put forward the model of zero-error distributed function compression system of two binary memoryless sources X and Y, where there are two encoders En1 and En2 and one decoder De, connected by two channels (En1, De) and (En2, De) with the capacity constraints C1 and C2, respectively. The encoder En1 can observe X or (X, Y) and the encoder En2 can observe Y or (X, Y) according to the two switches s1 and s2 open or closed (corresponding to taking values 0 or 1). The decoder De is required to compress the binary arithmetic sum f(X, Y) = X +Y with zero error by using the system multiple times. We use (s1s2; C1,C2; f) to denote the model in which it is assumed that C1 ⩾C2 by symmetry. The compression capacity for the model is defined as the maximum average number of times that the function f can be compressed with zero error for one use of the system, which measures the efficiency of using the system. We fully characterize the compression capacities for all the four cases of the model (s1s2; C1,C2; f) for s1s2= 00,01,10,11. Here, the characterization of the compression capacity for the case (01; C1,C2; f) with C1>C2 is highly nontrivial, where a novel graph coloring approach is developed. Furthermore, we apply the compression capacity for (01; C1,C2; f) to an open problem in network function computation that whether the best known upper bound of Guang et al. on computing capacity is in general tight.

个人简介：**光炫**博士，南开大学数学科学学院教授，入选国家青年人才项目及南开大学百名青年学科带头人培养计划。2012年毕业于南开大学陈省身数学研究所，获博士学位，其中2011年1月至2012年8月在美国南加州大学从事联合培养博士（留学基金委和美国自然科学基金资助）。2015年11月至2018年11月在香港中文大学网络编码研究所从事研究工作（香江学者）。2016年入选“香江学者计划”。研究兴趣为信息论、编码理论与密码学；目前的研究方向为面向函数计算的信息论和编码理论。近年来完成一部学术专著Linear Network Error Correction Coding，由德国Springer出版发行；发表学术论文40余篇，其中在IEEE Trans. Inf. Theory, IEEE J. Sel. Areas Commun., IEEE Trans. Commun., USENIX Security等发表论文近二十篇。研究成果获多个国内外会议的最佳论文奖。入选天津市“三年千人”高层次人才计划。