

Abstract

Quantum Shannon theory is a relatively new field which lies at the intersection of the two important sciences of the twentieth century: the quantum theory and information theory. The two fundamental questions which drives research in this area are: What are the ultimate capabilities of computation and information processing with quantum mechanical systems? In the last two decades investigations into this question have blossomed into a rich area of research. In this talk, we will discuss a new framework and tools for designing communication protocols over quantum channels. This framework also gives a unified approach for designing optimal classical protocols for many network communication scenarios.