

Source-Channel Communication in Networks: Separation Theorems and Beyond

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Abstract: I will first present several results on the optimality of the source-channel separation architecture for lossy source coding in general networks. These results are shown without explicitly characterizing the achievable joint source-channel coding distortion region or the achievable separation-based coding distortion region.

I will then consider the source broadcast problem and show that, through a suitable application of reduction techniques, source-channel separation theorems can be used to prove the optimality of non-separation based schemes (e.g., hybrid coding schemes) and determine performance limits even in scenarios where the separation architecture is suboptimal! Other converse methods for the source broadcast problem will also be discussed.

This talk is based on joint work with Kia Khezeli, Lin Song, Chao Tian, Suhas Diggavi, and Shlomo Shamai.