JOINT SOURCE–CHANNEL CODING FOR LATTICE WATERMARKING (WedAmOR9)

★ Author(s) :

Abdellatif Zaidi   (LSS/CNRS Supelec and ENST, France)

Pierre Duhamel   (LSS/CNRS, France)

★ Abstract :

Coset–based codes are often proposed as an alternative to the theoretical probabilistic random binning in network coding. In this paper nested lattice codes recently proposed for multiterminal binning are used to devise a structured high dimensional Costa scheme for data hiding. The resulting embedding scheme overcomes both the famous Scalar Costa Scheme (SCS) and regular Quantization Index Modulation (QIM). Performances are studied within the context of a Modulo Lattice Additive Noise (MLAN) channel. We first show that the gap to the full AWGN capacity can be partially bridged up using some finite–dimension lattices with good packing properties. Next we use a binning interpretation to argue that information embedding can also be understood as a source–channel coding problem and that nested lattices provide means of constructing efficient low complexity, good source–channel codes. The resulting paradigm connects information embedding to the two rich area of source and channel coding and gives insights –through an example– into the construction of fine/coarse lattices. For illustrations purposes, Monte–Carlo integration–based capacity and simulation–based bit–error rate (BER) curves are provided.

Menu