INFORMATION AND CONTROL: MATCHING CHANNELS

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For Mark Pinsker on his 70th birthday.

Abstract

The transmission problem for noisy channels is usually studied under the condition that the decoding error probability λ is small and is sometimes studied under the condition that $\lambda = 0$. Here we just require that $\lambda < 1$ and obtain a problem which is equivalent to a coding problem with small λ for the "Deterministic Matching channel". In this new model a cooperative person knows the codeword to be send and can choose (match) the state sequence of the channel. There are interesting connections to combinatorial matching theory and extensions to the theory of identification as well as to multi–way channels. In particular there is a surprising connection to Pinsker's coding theorem for the deterministic broadcast channel.

Keywords:

New channel models, combinatorial matching, zero–error problems, detection, identification, feedback.