

Convolutional decoding through a tracking problem

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Resumen

Convolutional codes can be regarded as discrete time linear systems. This relationship has been studied along decades, and concepts from both theories have found their counterparts into the other one.

In this context, decoding of a received word can be interpreted as a tracking problem. This should allow to give practical decoding algorithms for convolutional codes.

However, coding theory is usually studied over finite fields while optimal control problems have been considered over the real or complex fields. The solutions to these problems are not applicable as they make use of an Euclidean metric in which finite fields lack.

We state a tracking problem over finite fields using the Hamming metric instead of a bilinear quadratic form, and we propose a solution via block decoding. In particular, we focus on the tracking problem associated to a convolutional decoding problem, which leads to a method for decoding general convolutional codes. Under some conditions, a bigger number of errors than half the minimum distance can be corrected.

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Referencias

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