

Burst Errors

What if our channel is not symmetric?

In particular, what if symbol-errors tend to come close together, in "bursts"

So (xx x) is more likely than (x x)

This is often the case (scratches, lightening,...)

(See handout)

We'll consider two ways to adapt our methods.

1) (now) Interleaved codes

These spread a burst of symbol errors among several words, which can then each be corrected.

2) (later) A trick with \mathbb{F}_q , q not prime.

(Handout)

Example

for $C = \{ (0, 0, 0, 0, 0), (1, 1, 1, 1, 1) \} \in \mathbb{F}_2^5$

Consider 3 C

It has a codeword

$c = (1, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1)$

made from $(1, 1, 1, 1, 1)(0, 0, 0, 0, 0)(1, 1, 1, 1, 1)$

If this word is received as

$(1, 0, 1, 1, 1, 0, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1)$

We de-interleave it.

11100

00100

11001

and n.n. decode these words to

11111

00000

11111

then re-interleave to C