



VITERBI

DECODER

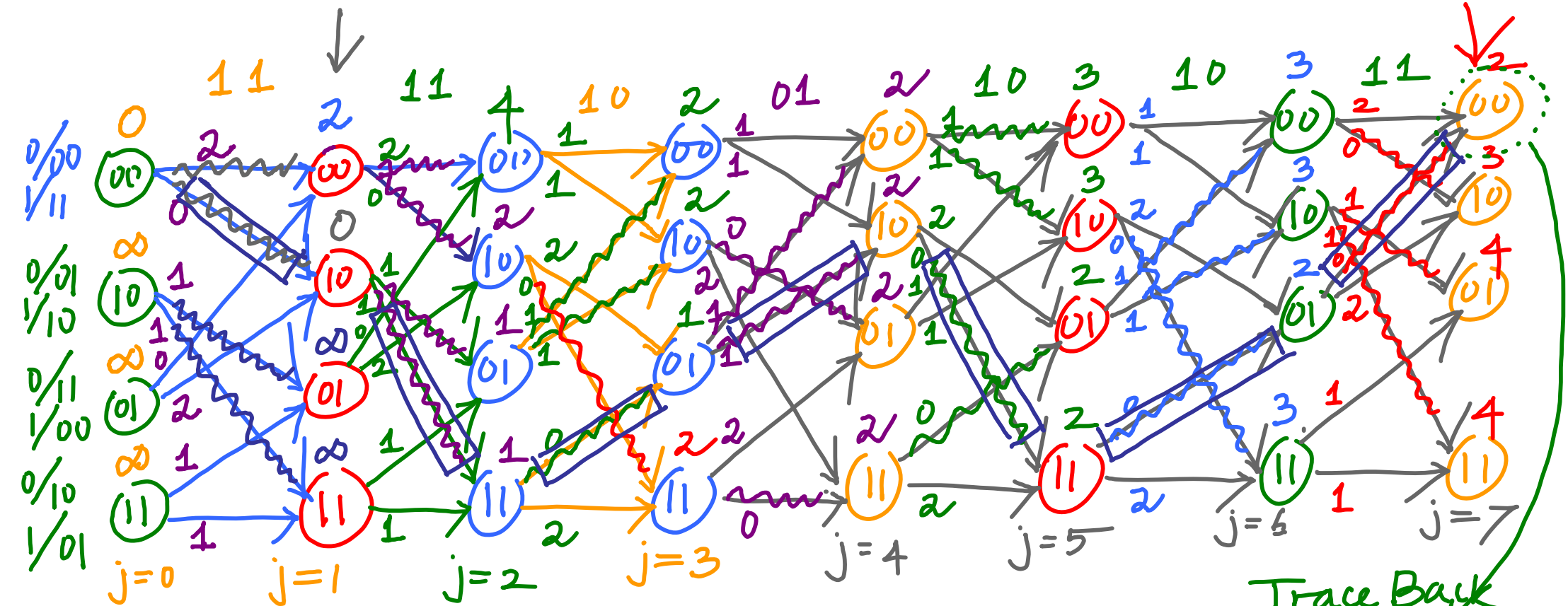
Example:

Trellis Based
Decoder

$\bar{r} = 11 \ 11 \ 10 \ 01 \ 10 \ 10 \ 11$

At each state store only
- min distance path

$d_{\min}(\bar{c}, \bar{r})$



At $j=0$, $d_{\min}(00) = 0$
 $d_{\min}(01) = d_{\min}(10)$

$= d_{\min}(11) = \infty$
 at $j=1$
 $d_{\min}$ to 00
 $= \min \{ 0 + 2, \infty + 0 \}$
 dist to 00 distance from 01 to 00

$$= \min \{2, \infty\}$$

$$= 2$$

$d_{\min}$ to 10 at $j=1$

$$= \min \{0 + 0, \infty + 2\}$$

$$= \min \{0, \infty\}$$

$$= 0$$

 Rectangles denote the minimum distance path

State Sequence for min distance path:

00 10 11 01 10 11 01 00

Decoded Codeword:

11 10 10 00 10 10 11

Viterbi Algorithm

Maximum Likelihood Estimate

1 1 1 1 1 0 0 1 1 0 1 0 1 0

2 mismatched bits
 $\Rightarrow d_H(\bar{C}, \bar{r}) = 2$
 $d_{\min}$

Information Bit Sequence

1 1 0 1 1 0 0

ML Decoded Bits