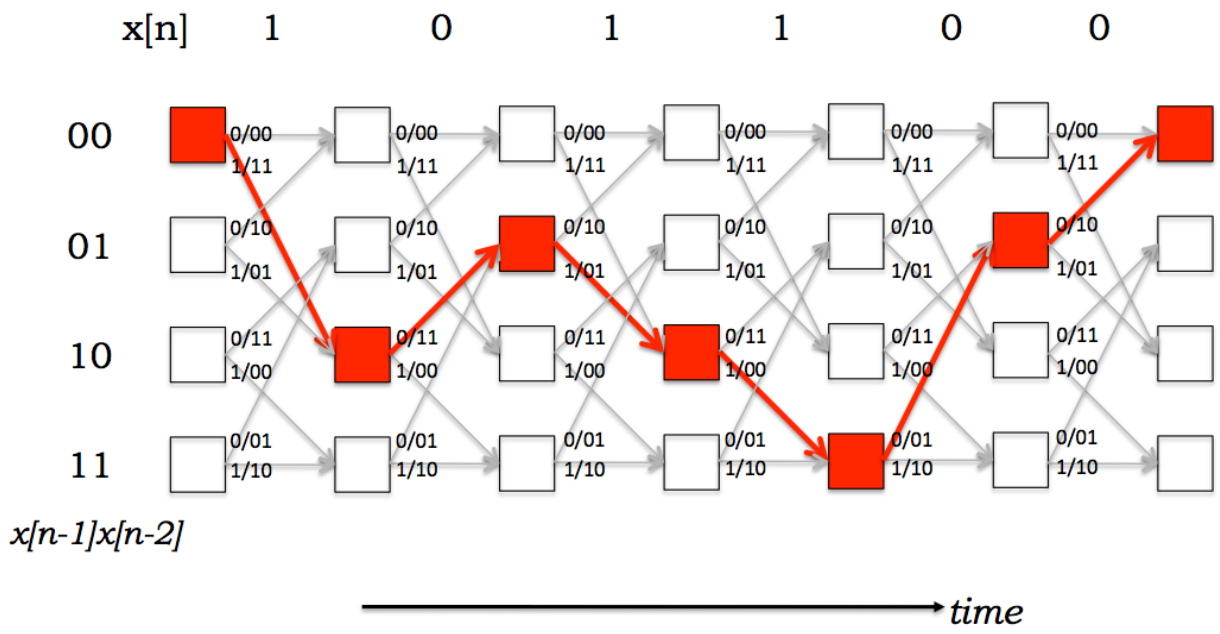

Figure 8-5: The trellis is a convenient way of viewing the decoding task and understanding the time evolution of the state machine.

at each instant when the sender has a message bit to process, but doesn't show how the system evolves in time. The trellis is a structure that makes the time evolution explicit. An example is shown in Figure 8-5. Each column of the trellis has the set of states; each state in a column is connected to two states in the next column—the same two states in the state diagram. The top link from each state in a column of the trellis shows what gets transmitted on a "0", while the bottom shows what gets transmitted on a "1". The picture shows the links between states that are traversed in the trellis given the message 101100.

We can now think about what the decoder needs to do in terms of this trellis. It gets a sequence of parity bits, and needs to determine the best path through the trellis—that is, the sequence of states in the trellis that can explain the observed, and possibly corrupted, sequence of received parity bits.

The Viterbi decoder finds a maximum likelihood path through the Trellis. We will study it in the next lecture.