

72.3280 Capacity enhancement methods for radio interface
To be returned before 26.04.2007

Home assignment 3

You are given MATLAB based simulator for simulating BER of channel equalizer and Convolutional decoder. Assume binary code.

By using the simulator do following

- 1) Calculate approximation for the union bound for Viterbi equalizer in channel $h = [1 \ 0.5 \ 0.3]$ and in additive white Gaussian noise. Consider only first error event. The input to the channel is binary BPSK modulated signal.
- 2) Simulate the performance by using given simulator for equalizer (in file "ExampleViterbiEq.m")
Compare and comment on the results
- 3) Calculate the approximation for the union bound for Viterbi decoder for a binary code generated by two forward polynomials
$$g^{(1)} = (1 \ 1 \ 0 \ 1), \ g^{(2)} = (1 \ 1 \ 1 \ 1).$$
Consider only the two least hamming weight error events.
- 4) Simulate the performance by the given simulator in file "ExampleViterbiCC.m".
Compare and comment on the results.