

ELEG812 Wireless Digital Communications
Final Project (Spring 2011)
Due date: 5:00pm, May 25
(no late project will be accepted)

Simulate the following CDMA system with two users and each user's block diagram is shown in the following figure:

1. At the transmitter, rate $\frac{1}{2}$ or $\frac{1}{3}$ convolutional codes with constraint length 3 or above are used. The CDMA codes can be generated from Matlab random sequence generators but should be binary. Then, generate two ray *slow* Rayleigh fading, where the first ray is with the unit energy and second ray is with energy 0.7.
2. At the receiver, the RAKE receiver should be used for the CDMA demodulation. Then, the Viterbi *soft* decoding algorithm should be used.

You should turn the following things to me (email me your final project at xianggen@gmail.com):

1. A written report on what you have done including all the parameters you have chosen for the simulations and explain them and also including the performance analysis (a nontrivial BER bound shall be sufficient).
2. Plot the two ray Rayleigh fading magnitude waveforms in one figure.
3. Plot the BER vs. E_b/N_0 curves of your theoretical and simulation results.
4. Email me your matlab codes at xianggen@gmail.com, where a readme file should be included so that I will be able to check your programs.

