Homework IV

1. (20%) Assume that there are L (L = 1, 2, 3, 4) diversity branches of uncorrelated Rayleigh fading signals. Each branch has the same average symbol energy-to-noise power ratio E_s/N_0, for E_s/N_0 = 1, 3, 5, 7, and 9 dB. Simulate the QPSK bit error probability (at least to $P_b = 10^{-4}$) for (a) Selective Combining; (b) Maximal Ratio Combining; (c) Equal Gain Combining; and (d) Direct Combining (which combines all paths directly and then **compensates the overall phase shift** before demodulation).

(1. You may generate the fading gains via combining a Rayleigh random number and a uniform random phase, or via combining two Gaussian random variables (complex Gaussian). 2. For coherence detection, you must equalize the phase before demodulation.)

2. (20%) Repeat the problem for uncorrelated Ricean fading with K = 1.
3. (10%) Compare and discuss the results for different cases.

- 助教: EECS Room 605, TWNTHUCOM5170@gmail.com
- Due Date: **11/30** (You shall submit your report and program to the class email account.)