

Project Confirmation Memo:

Name of students in group: Matt Pregara and Zack Saigh

Exact title of project: Low Density Parity Check Code Implementation

Advisors of the project: Dr. Ahn and Dr. Lu

No more than eight letter lowercase acronym of the project: ldpci

University login name of each student in group: mpregara and zsaigh

Brief description of the project:

In communication systems, forward error correction (FEC) codes have been widely used to battle data transmission errors caused by the unreliable channel. By adding extra bits to the end of message bits, a certain number of bit errors can be detected and corrected without frequent retransmission in case of data transmission failure. Low density parity check (LDPC) code provides high performance in forward error correction. It is able to get very close to the limit of channel capacity which was established by Claude Shannon in the 1940's. In addition, LDPC code has less complexity in the decoding process compared with other FEC codes. With the advance in computing power, it has been adopted in many high speed communication standards such as digital video broadcasting, WiMAX, 4G wireless systems, etc.

LDPC code will be studied in this project. MATLAB/Simulink will be used to simulate the encoding and decoding process of LDPC code. The performance of LDPC will be evaluated through simulations. Field programmable gate array (FPGA) will be used to implement the decoders for LDPC code.