INP3060357 – Channel coding – Year 2014/2015

Project Assignment

We wish to implement in MatLab/C an encoder and message passing decoder for either a turbo code (parallel concatenated code), an LDPC code, or a serial concatenated code, and to test its performance. The outcome should be presented with the help of slides at the oral exam. The presentation should include:

1. description of the encoder (and of the standard it refers to);
2. field of applications;
3. description of the message passing decoder (either sum-product or min-sum);
4. discussion on the specific MatLab implementation;
5. performance evaluation in AWGN settings (BER or PER);
6. any other performance evaluation which may be meaningful for the chosen code, e.g., performance evaluation with different puncturing patterns.

The following codes are assigned to the class:

1. Barbiero Serena: LTE - Turbo
2. Chiarotti Federico 802.11.n - LDPC
3. Gasparetto Stori Riccardo: DVBT2 - LDPC
4. Guidolin Arianna: ETHERNET - LDPC
5. Olivier Alain : 802.22 - Turbo
6. Palmieri Luca : HSPA - Turbo
7. Pilon Giovanni: IEEE 1901 - LDPC
8. Piovesan Nicola: DEEP SPACE - LDPC
9. Scalabrin Maria: DVBS2 - LDPC
10. Toigo Enrico: G.975.1 - LDPC
11. Trinh Hong Duy: UMTS - Turbo
12. Turi Leo: Raptor codes
13. Vadari Valentina: WIMAX - LDPC