INP3060357 – Channel coding – Year 2016/2017

Project Assignment

We wish to implement in MatLab/C an encoder and message passing decoder for either a turbo 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, min-sum, or both);
4. discussion on the specific MatLab implementation;
5. performance evaluation in AWGN settings (BER and/or PER);
6. any other performance evaluation which may be meaningful for the chosen code, e.g., performance evaluation with different puncturing patterns, packet lengths, etc..

The following codes are assigned to the class:

1. Ahmed Anas: DVBRCs - Turbo - binary, BICM
2. Ba Aly: CDMA2000 - Turbo - binary only
3. Ben Salah Taha: HSPA - Turbo - binary, BICM
4. Bianchet Loris: DVBS2 - LDPC - binary BICM
5. Bucciol Nicola: 802.11.n - LDPC - binary, BICM
6. Cecchinato Davide: ETHERNET - LDPC - binary, BICM
7. Chiariello Leonardo: PLC IEEE1901 - LDPC - binary, BICM
8. Eleuch Salma: UMTS - Turbo - binary only
9. Elnaria Ahmed: 802.22 - Turbo - binary, BICM
10. Finotto Federico: SUBMARINE G.975.1 - LDPC - binary only
11. Formaggio Francesco: DEEP SPACE - LDPC - binary only
12. Gafsi Molka: DVBC2 - LDPC - binary, BICM
14. Limutti Simone: 802.20 - LDPC - binary, BICM
15. Marcon Gianluca: DEEP SPACE - Turbo - binary only
16. Massariollo Stefano: 802.20 - Turbo - binary, BICM
17. Mzoughia Amir: DVBT2 - LDPC - binary, BICM
18. Piccoli Carlo: LTE - Turbo - binary, BICM
19. Zugno Tommaso: WIMAX - LDPC - binary, BICM