

**INFSO-ICT-216203 DAVINCI****D7.3.1*****Winter School / Workshop***

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Abstract:

This document describes the status and the programme of the workshop “Channel Coding and Cooperation in Wireless Communications”, which has been organized as D7.3.1 according to the DoW.

Keyword list: dissemination, workshop, conference, publication

Disclaimer:

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1. Description of the Workshop

The workshop “Channel Coding and Cooperation in Wireless Communications” has been organized together with the NoE NEWCOM++ and was accepted as one of the pre-conference workshops at the ICT MobileSummit 2009. It will be held on Tuesday, 9 June 2009. The main organizer on behalf of DAVINCI is Prof. Marco Luise, while the contact person from the side of NEWCOM++ is Jossy Sayir.

More information is available at <http://www.ict-mobilesummit.eu/2009/default.asp?page=relevants>

For convenience, the current programme is repeated below:

Title:

Channel Coding and Cooperation in Wireless Communications

Abstract:

Higher efficiency and reliability are the keywords for the definition of the physical layer of forthcoming wireless communications standards. In this picture, a fundamental role is played by those signal formatting techniques such as channel coding and modulation. The new techniques introduced in this respect in the late 90s, namely, turbo and LDPC coding with iterative detection on one side and MIMO system with space-time coding on the other are entering their maturity. The aim of the workshop is twofold: on one hand it intends to review what we may call now the “classical” techniques mentioned above, especially trying to sum up about their myths and realities. On the other, the latest research trends in the field will be showcased: non-binary LDPC codes, rateless and fountain codes, efficient/parallel decoding algorithms for VLSI implementation, joint iterative decoding and parameter estimation, just to mention a few. Particular attention will be devoted to cooperative coding techniques that may play a key role in future scenarios for wireless information interchange such as sensor and vehicular networks.

Description:

The organizer of the workshop will be the DaVinci FP7 STREP <http://www.ict-davinci-codes.eu/>, in particular Prof. David Declercq from ENSEA, Cergy-Pontoise, Prof. Ezio Biglieri from Università Pompeu Fabra, Prof. Marco Luise from the University of Pisa, Prof. Emmanuel Boutillon from Université Bretagne Sud, and Stefan Pfletschinger from CTTC, together with the FP7 Network of Excellence NEWCOM++ and the Radio Access & Spectrum RAS cluster in the person of Jossy Sayir. Major companies like Samsung, STMicroelectronics etc. will be involved in the organizing committee as well. The discussion will focus on the impact of channel coding and modulation techniques on the performance and the cost/complexity of wideband wireless communications terminals for 4G and beyond. In particular, the workshop will feature a panel discussion on such topics.

Objectives:

A number of FP7 projects is dealing at the moment with the topics of concern of this workshop. Its aim is just to attract all those people, as well as researchers from the non-EC-projects-related scientific community to build a temporary forum at the European level and give an opportunity for a thorough coordinated discussion. At a first glance the subject may appear as dedicated to specialists only. On the contrary, the workshop aims at involving a broader audience since the techniques that will be discussed are included in any of the forthcoming standards for the (wireless) Internet of the future, and have a large impact on the design of user terminals. This is particularly relevant since it is relatively difficult to find such an occasion in large International conferences, and/or EC-generated meetings.

Target Audience:

All those EC projects concerned with physical layer design or performance evaluation. Major European companies and SMEs interested in research and development of such techniques, as well as technology transfer from academia to manufacturers. The workshop will be advertised in the FP7 RAS cluster, in the NEWCOM++ NoE, and in mailing lists like MyColleagues.

Workshop Duration:

Full day

Programme:

Ezio BIGLIERI (WISER, DaVinci): “Coding for the future Internet”

Emmanuel BOUTILLON (Univ. Bretagne Sud, DaVinci): "Fast and clean : efficient implementation of iterative decoders"

David DECLERCQ (ENSEA, DaVinci): "Ultra sparse Non-binary LDPC codes based on Protographs",

Bernard FLEURY (Univ. Aalborg, NEWCOM++): "Turbo-synchronization in 4G systems",

Marco LUISE (Univ. Pisa, DaVinci/NEWCOM++): "Iterative processing in data receivers"

Guido MONTORSI (Polit. Torino, NEWCOM++): "Rate-Compatible Multiple Concatenated Turbo-Codes"

Jossy SAYIR (FTW Vienna, NEWCOM++): "New frontiers of iterative decoding"

Luc VANDENDORPE (Univ. Cathol. Louvain, NEWCOM++) : "Cooperation in wireless networks"

E. ARIKAN *et alii*: "A comparison of polar codes with 802.16e block turbo codes"

Target Audience: Specialist Interest

Core Conference Themes: "4G and beyond".