S.M.P.T.E.

Montréal / Québec / Ottawa Chapter

Evening Presentation Notice

Date : **Tuesday, February 27th, 2018**
Time: 18 h 00 to 21 h 15
Location: **Télé-Québec** Studio TV2 (follow signs from reception)
1000, rue Fullum, Montréal (Québec) H2K 3L7
Fee Parking across the street
Organized by: Guy Bouchard TQ, François Bourdua VS-TEK
Sponsored by: SMPTE Montréal and Capella

Subject: **La SMPTE welcomes the IEEE**

- **ATSC 3.0 physical layer for the layman**
- **Iterative Detection and Coding in NOMA for Multi-Content Multimedia Broadcasting**
- **Cooperative NOMA in Multi-Content Multimedia Broadcasting**
- **Grounding prerogatives for Radio and Television Production Facilities**

IMPORTANT: **In order to participate to this evening, you need to register via Eventbrite before February 20th.**
This presentation is open to all but seating is limited.
A streaming service on our Facebook page
(https://www.facebook.com/SMPTEMTL/)

18 h 00 to 19 h 00: Happy Hour
Bites and beverages will be served.

19 h 00 to 19 h 30: Guy Bouchard, ATSC 3.0 physical layer for the layman
Presentation will be in French, question in both official languages

ATSC 3.0 promises unprecedented flexibility in the field of broadcasting. Advanced reporting, COFDM modulation, Layer Division Multiplexing (LDM) are just some of the techniques implemented in ATSC 3.0. This presentation will cover these technical prowess in clear and colorful language that will allow all people with a minimum of scientific mind to come out with a clear understanding of this new standard and its impacts.

19 h 30 to 20 h 00: Nazli Khanbeigi,, Iterative Detection and Coding in NOMA for Multi-Content Multimedia Broadcasting
Presentation will be in English, question in both official languages

We propose iterative detection and coding (IDD) algorithm for cooperative non-orthogonal multiple access (NOMA) in multi-content broadcasting systems with low density parity check (LDPC) codes. Our proposed cooperative NOMA scheme is based on two broadcasters cooperatively sharing and transmitting their multimedia over the same frequency band, which results in reception of the multimedia with different timing at the users. Relative to the location of the receivers, the data frames from the closer broadcaster would be received sooner than the one's from the farther. This results in extra delay and timing errors that would degrade the expected performance. In our scheme, to provide multimedia content with two robustness levels, they are superimposed in a layered division multiplexing (LDM) scheme; hence, the receivers with successive interference cancellation (SIC) are considered. Our strategy is to use a scheduling algorithm which considers the soft a posteriori output of the decoder that can reduce the number of required iterations and achieve lower bit error rates (BER).

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20 h 15 to 20 h 45: Me Reza Soleymani, Cooperative NOMA in Multi-Content Multimedia Broadcasting
Presentation will be in English, question in both official languages

We propose a novel cooperative non-orthogonal multiple access (NOMA) multi-content broadcasting system, where the two broadcasters cooperatively share and transmit their multimedia over the same frequency band in a time division multiplexing (TDM) scheme. Both data streams with two robustness levels are superimposed in a layered division multiplexing (LDM) scheme. This combined TDM/ LDM model introduces a two-stage decoding process, managing core-layer based on the LDM principles, and enhanced layer based on successful interference cancellation (SIC). Compared to the current single-content orthogonal methods employed in broadcast networks, our contribution is a cooperative NOMA scheme in multi-content broadcasting with extended coverage and throughput. We further investigate our scheme in digital TV (DTV) broadcast channels based on ATSC 3.0, where we benefit from the use of adaptive coding and modulation and LDM. The simulation results confirm the gains achieved in coverage and throughput without any extra complexity added to the receivers.

20 h 45 to 21 h 15: Guy Bouchard, Grounding prerogatives for Radio and Television Production Facilities
Presentation will be in French, question in both official languages

The broadcasting industry uses very specific grounding strategies. The broadcasting environment is benefiting and experiencing the storm of IT implementations. These have different prerogatives. In addition, the advent of class D power supplies brings its share of opportunity and problems. The presentation will cover traditional grounding techniques, analyze their rationale and propose the required changes.

Biographies:

Mr. Guy Bouchard is Technical Director for the antenna network at Télé-Québec. He is known to have worked for a few decades as Premier Chef aux Nouvelles Technologies for the CBC. Guy is a graduate of the University of Quebec in Telecommunications. He is a board member of the IEEE Broadcast Technology Society (IEEE BTS). He is a regular speaker for the IEEE BTS. Guy has been serving the industry since 1979 with a particular interest in digital telecommunications. He has delivered multiple presentations in digital TV, satellite communication and signal transport for IEEE BTS, NAB, IBC, CCBE, CDTV and SMPTE.

Nazli A. Khan Beigi received her B.Sc. degree from Sharif University of Technology, Tehran, Iran, in 2003, and the M.Sc. from the University of Science and Technology, Tehran, Iran, in 2005, both in electrical engineering. From 2005 to 2014, she worked as electrical engineer in industrial projects in Iran. She is currently working toward her Ph.D. degree in electrical and computer engineering at Concordia University, Montreal. Her research interests lie in the area of wireless communications and include information theory, NOMA, source and channel coding, digital broadcasting, and their application in 5G systems.

Mohammad Reza Soleymani (S'84–M'88–SM'99) received the B.S. degree from the University of Tehran, Tehran, Iran, in 1976, the M.S. degree from San Jose State University, San Jose, CA, in 1977, and the Ph.D. degree from Concordia University, Montreal, in 1987, all in electrical engineering. From 1987 to 1990, he was an Assistant Professor with the Department of Electrical and Computer Engineering, McGill University, Montreal. From October 1990 to January 1998, he was with Spar Aerospace Ltd. (currently MDA), Montreal, where he had a leading role in the design and development of several satellite communication systems. In January 1998, he joined the Department of Electrical and Computer Engineering, Concordia University, as a Professor. His current research interests include wireless and satellite communications, information theory and coding.

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