



IEEE Benelux Joint Chapter on Communications and Vehicular Technology

25TH SYMPOSIUM ON COMMUNICATIONS AND VEHICULAR TECHNOLOGY IN THE BENELUX SCVT 2018

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Cultuur en congrescentrum Het Pand
Onderbergen 1, 9000 Gent

GHENT UNIVERSITY, GHENT, BELGIUM
<http://sites.ieee.org/benelux-comvt/symposium>

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Local Organization

- Heidi Steendam, heidi.steendam@ugent.be
- Nele Noels, nele.noels@ugent.be (tel. 0032 9 264 34 26).

Time	Communication Systems and Networks
9:30-10:00	Welcome
10:00-11:00	Keynote 1
11:00-11:15	Break
11:15-12:35	Paper presentations (20 min/paper, 4 papers)
12:35-13u30	Lunch
13:30-14:30	Keynote 2
14:30-15:15	Poster session
15:15-15:30	Break
15:30-16:10	Paper presentations (20 min/paper, 2 papers)
16:10-17:00	Keynote 3
17:00-17:15	Closure + best paper award announcement

KEYNOTE 1

Wireless Networks Optimization: Model-Based, Data-Driven, or Both?

Marco Di Renzo

Recently, deep learning has received significant attention as a technique to design and optimize wireless communication systems and networks. The usual approach to use deep learning consists of acquiring large amount of empirical data about the system behavior and employ it for performance optimization (data-driven approach). We believe, however, that the application of deep learning to communication networks design and optimization offers more possibilities. As opposed to other fields of science, such as image classification and speech recognition, mathematical models for communication networks optimization are very often available, even though they may be simplified and inaccurate. We believe that this a priori expert knowledge, which has been acquired over decades of intense research, cannot be dismissed and ignored. In the present work, in particular, we put forth a new approach that capitalizes on the availability of (possibly simplified or inaccurate) theoretical models, in order to reduce the amount of empirical data to use and the complexity of training artificial neural networks (ANNs). We concretely show, with the aid of some examples, that synergistically combining prior expert knowledge based on analytical models and data-driven methods constitutes a suitable approach towards the design and optimization of communication systems and networks with the aid of deep learning based on ANNs.

PAPER PRESENTATIONS 1

1. **A Stochastic Geometry Approach for SWIPT-based Real-Time Mobile Computing Systems** – Ayse Ipek Akin, Nafiseh Janatian, Ivan Stupia and Luc Vandendorpe
2. **Equalization Design for Dispersive MIMO Channels subject to Channel Variability** – Jelle Bailleul, Lennert Jacobs, Paolo Manfredi, Dries Vande Ginste, Mamoun Geunach and Marc Moeneclaey
3. **Towards Efficient BLE Mesh: Design of an Autonomous Network Joining Algorithm** – Clara Nieto-Taladriz, Yuri Murillo and Sofie Pollin
4. **On-Board Precoding in a Multiple Gateway Multibeam Satellite System** – Vahid Joroughi, Bhavani Shankar M.R., Sina Maleki, Symeon Chatzinotas, Joel Grotz and Björn Ottersten

KEYNOTE 2

Synthetic Molecular Communication: Fundamentals, Challenges, and Results **Robert Schober**

Synthetic molecular communication is an emerging research area offering many interesting and challenging new research problems for engineers, biologists, chemists, and physicists. Synthetic molecular communication is widely considered to be an attractive option for communication between nano-devices such as (possibly artificial) cells and nano-sensors. Possible applications of nano-communication networks include targeted drug delivery, health monitoring, environmental monitoring, and "bottom-up" manufacturing. The IEEE and ACM have recently founded several new conferences and journals dedicated to this exciting new and fast growing research area. In this talk, we will give first a general overview of the areas of synthetic molecular communication and nano-networking. Components of synthetic molecular communication networks, possible applications, and the evolution of the field will be reviewed. We will focus particularly on diffusion based synthetic molecular communication, identify the relevant basic laws of physics, and discuss their implications for communication system design. Subsequently, typical communication engineering design and signal processing problems will be discussed. In particular, methods for intersymbol interference mitigation will be investigated in some detail. Furthermore, preliminary experimental results will be provided. In the last part of the talk, we will discuss some research challenges in synthetic molecular communication.

POSTER SESSION

1. **Effect of TI-ADC Mismatches on OFDM BER** – Vo-Trung-Dung Huynh, Nele Noels and Heidi Steendam
2. **Using Cheap RTL-SDRs for Measuring Electrosmog** - Brecht Reynders, Rachel Nkem Iyare, Sreeraj Rajendran, Vladimir Volski, Guy Vandenbosch and Sofie Pollin
3. **Feature Selection for Machine Learning Based Step Length Estimation Algorithms** – Stef Vandermeeren, Herwig Bruneel, Heidi Steendam
4. **Multicarrier Phase Modulated Continuous Waveform for Automotive Joint Radar-Communications System** – Sayed Hossein Dokhanchi, Bhavani Shankar M.R., Thomas Stifter and Björn Ottersten
5. **TREE: A Traffic-aware Energy Efficient FTDMA Scheduling Algorithm** – Tim van der Lee, Georgios Exarchakos and Sonia Heemstra de Groot
6. **Classification of LPWAN technologies using Convolutional Neural Network** – Adnan Shahid, Jaron Fontaine, Ingrid Moerman and Eli De Poorter

PAPER PRESENTATIONS 2

1. **Evaluation of An Efficient Control Strategy for A Multi-user UAV-based Wireless Network** – Sami Mezhoud, Jianqiao Cheng, Ke Guan and Francois Quitin
2. **Adaptive video streaming based on TFRC protocol in vehicular ad-hoc networks (VANETs)** – Mohamed Aymen Labiod, Jordan Doublet, Mohamed Gharbi, Francois-Xavier Coudoux

KEYNOTE 3

Pozyx Ghent