EDITORIAL

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Forewords of special issue on "GRETSI 2019" colloquium

Patrick Abry¹ • Olivier Michel² • Henri Maître³

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GRETSI, Groupe d'Etudes du Traitement du Signal et des Images (http://gretsi.fr/association-gretsi.php) is an association, as defined by the French 1901-law, aiming to support, promote, and develop the teaching and research activities of the French-speaking signal and image processing community. Among its main objectives are the organizations of a summer school, open to doctorate students and young researchers, each year dedicated to a different topic in relation with the broad field of information processing (http://gretsi.fr/ ecole-d-ete-de-peyresq.php), as well as of a yearly "Best PhD" prize (http://gretsi.fr/prix-de-these.php).

The highlight activity of GRETSI remains the organization of the biennial "Colloque" (symposium, http://gretsi.fr/ colloque.php) that has established a long tradition of bringing together above 500 participants from the Frenchspeaking and non-French-speaking research communities related to communication and coding, information representation, modeling, analysis and processing, decision-making and interpreting, and software and hardware architecture design, with the goal of promoting interactions between academic and industrial researches. The "Colloque GRETSI" brings together doctorate students, post-doctorate, and young researchers with senior scientists, and thus significantly contributes to a scientific hand-over across generations from long-experienced world-renowned scientists and young researcher-to-become students.

The "Colloque GRETSI" was initiated in 1967. It has since 1999 started a Tour-de-France, visiting the most prestigious university cities of the French speaking world, sometimes outside French boundaries. The 2019 edition was held in Lille and the 2021 edition will take place in Nancy,

Henri Maître henri.maitre@telecom-paris.fr

¹ CNRS, ENS de Lyon, Lyon, France

² Grenoble-Alpes, Grenoble-INP, Grenoble, France

³ Telecom-Paris, Institut Polytechnique de Paris, Palaiseau, France

The contributions accepted at the "Colloque GRETSI" (above 300, some written in English) are of the same quality of those published in most major international conferences of the field. This never-denied along editions quality likely stems from the motivation of each participant to present his/her brightest contributions in front of an audience that likely gathers most if not all the French-speaking community of the field. A privileged meeting place for the community for more than 50 years, the "Colloque GRETSI," constitutes indeed a unique opportunity to present the latest advances in the field, on theoretical, applicative, and experimental levels.

The 2019-Lille edition was no exception to this highquality standard. This encouraged to consider the possibility, beyond conference proceedings, to organize a Special Issue of expanded contributions. This led to accept the invitation of the "Annals of Telecommunications" to host a "GRETSI 2019"-Special Issue. Because GRETSI welcomes more and more international researchers during special sessions or invited plenary sessions and is increasingly open to communications in English, it was decided that expanded articles would be written in English, at the careful and selective invitation of the Program Committee.

While the scope of the contributions presented at GRETSI is very large, the selection process was in purpose biased toward the general theme of "the Annals of Telecommunications," and thus more focused on communication and coding. Several articles hence deal with one of the fundamental problems raised by modern telecommunications: the management of energy resources and/or transmission capacity. The article by Yaoumi et al. describes a method for optimizing the energy consumed by LPDC decoders based on protographs, under performance constraints. The emergence of interactive compression methods, allowing the user to extract only a part of the specific interest in the transmitted data. has led to the development of compression methods using a statistical model of the data; the choice of a model and the cost induced in terms of transmission by the use of approximate or erroneous models are discussed in the article by Bidgoli et al. The synchronization of transmission sequences also leads to energy costs; the calculation of synchronization error bounds

is thus proposed by The Phuong Nguyen et al. for two synchronization scenarios and then used to study an optimal trade-off. Among the transmission technologies that are generating hopes, and hence numerous research works, quantum communications are of particular interest. In their article, Chapeau-Blondeau et al. explore the possibilities of (re)formulating classical tools for signal estimation and analysis in the quantum context, and show the interest of such tools. Finally, outside the disciplinary field of telecommunications, Pascal et al. propose a research article of broad scientific interest, in which a nonlinear filtering method is developed, accompanied by a fast recursive algorithm whose hyper-parameters can be automatically tuned from data. While the proposed applications are in the field of experimental physics, the interest of the proposed method lies in its applicability to low SNR, and to (very)large size data, which match issues encountered in many different fields, various in nature. This is highly representative of the motivations and spirit of the researches and results presented at "Colloque GRETSI."

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