

# Séminaire ICI : Elisabeth de Carvalho

05 Mars 2020, 15:00 – 16:30

## Titre du séminaire et oratrice

A communication model for holographic MIMO.

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## Date et lieu

Jeudi 5 mars 2020, 15h.

ENSEA, salle 384.

## Abstract

We describe two current trends in the post massive MIMO research: extra-large scale MIMO and holographic MIMO. Both are extensions of massive MIMO and call for a new generation of base stations equipped with an even larger number of antennas. In extra large scale MIMO, the antenna array at the access point has a very large dimension. In holographic MIMO, the arrays are not necessarily large and are a collection of tiny closely-spaced antenna elements. The prime focus of this presentation is to describe a communication model for holographic MIMO. The proximity of the antenna elements results in mutual coupling. Therefore, it is important to account for the mutual coupling in the communication model but also in the transceiver design. For a single user communication, the optimal transmitter consists of the inversion of the mutual coupling matrix followed by a filter matched to the channel vector. We show that the potential gains of holographic MIMO are superior to conventional arrays with antenna spacing of half a wavelength.

## Bio

[Elisabeth de Carvalho](#) received the Ph.D. degree in electrical engineering from Telecom ParisTech, France in 1999. After her Ph.D. degree, she was a Post-Doctoral Fellow at Stanford University, Stanford, CA, USA, and then worked in industry in the field of DSL and wireless LAN. Since 2005, she has been with Aalborg University, where she is a Professor and has led several research projects in wireless communications. She has co-authored the book “A Practical Guide to MIMO Radio Channel”. Her main expertise is in the field of signal processing with emphasis on MIMO communications. She is a member of IEEE Signal Processing Society, technical committee “Signal Processing for Communications and Networking” (SPCOM) and vice chair of the IEEE COMSOC Emerging Technology Initiative on Machine Learning for Communications. She is the project manager of the H2020 Innovative Training Network WindMill focusing on machine learning for wireless communications.

