

# Séminaire ICI : Tobias Oechtering

10 Avril 2018, 14:00

## Titre du séminaire et orateur

Privacy-Utility Trade-Off through Management of Hypothesis Tests.

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## Date et lieu

mardi 10 avril 2018, 14h

ENSEA, salle 384

## Abstract

In this talk we will first provide a review on our previous results on adversarial hypothesis testing for smart meter privacy. In the following, we will extend those results considering a trade-off of hypothesis tests on correlated privacy hypothesis and utility hypothesis. An asymptotic error exponent of an optimal hypothesis test on the privacy or utility hypothesis can be characterized by the corresponding minimal Chernoff information with an i.i.d. observation sequence. For the general case with an arbitrary random observation sequence, an error exponent is bounded in terms of the corresponding minimal Chernoff information rate. A privacy-utility trade-off is then formulated for an optimal management, which protects the privacy by minimizing the error exponent of the privacy hypothesis test and meanwhile guarantees the utility hypothesis testing performance by a lower bound on the corresponding minimal Chernoff information rate. With the optimal management, the asymptotic minimum error exponent of privacy hypothesis test is shown to be characterized by the infimum of minimal Chernoff information rates subject to utility guarantees.

## Bio

Tobias Oechtering received his Dipl-Ing degree in Electrical Engineering and Information Technology in 2002 from RWTH Aachen University, Germany, his Dr-Ing degree in Electrical Engineering in 2007 from the Technische Universität Berlin, Germany, and his Docent degree in Communication Theory in 2012 from KTH Royal Institute of Technology. In 2008 he joined the Information Science and Engineering Department (previously Communication Theory Lab) at KTH Royal Institute of Technology, Stockholm, Sweden and has been an Associate Professor since May 2013. He is general chair of the 2019 IEEE Information Theory Workshop in Aug 25-28 in Visby, Gotland, Sweden and currently Associate Editor of IEEE Transactions on Information Forensic and Security. His research interests include network information theory, statistical signal processing, physical layer privacy and security, as well as networked

control.

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