

Séminaire SATIE

Lundi 20 juillet 2015 à 10h

Amphithéâtre 63 (ENS Cachan)

Yang Yang and Marius Pesavento

Department of Electrical Engineering and Information Technology, Darmstadt University of Technology, Darmstadt, Germany.

« The Iterative Descent Direction Method for Nonlinear Programming »

Abstract:

In this talk we propose a novel iterative optimization framework to compute locally optimal solutions for a wide class of nonconvex and non-smooth optimization problems. The stationary points of the original optimization problems are found by solving a sequence of successively refined approximate problems, each of which is presumably much easier to solve than the original problem. To guarantee convergence of iterative algorithm the approximate problem only needs to exhibit the weak pseudo-convexity property as compared to the strong convexity property required in existing iterative algorithms. The proposed method not only includes as special cases a number of existing methods, for example, the Gradient Method and the Jacobi Algorithm, but also leads to new algorithms which are easier to implement and faster to converge, as shown by two prominent example applications in communication networks and compressive sensing. We demonstrate that for the famous LASSO problem the convergence speed and the computational complexity of the proposed algorithm is significantly reduced as compared to the state-of-the-art optimization techniques.

Biography:

Marius Pesavento received the Dipl.-Ing. and M.Eng. degrees from Ruhr-Universität Bochum, Germany, and McMaster University, Hamilton, ON, Canada, in 1999 and 2000, respectively, and the Dr.-Ing. degree in electrical engineering from Ruhr-Universität Bochum in 2005. Between 2005 and 2007, he was a Research Engineer at FAG Industrial Services GmbH, Aachen, Germany. From 2007 to 2009, he was the Director of the Signal Processing Section at mimoOn GmbH, Duisburg, Germany. In 2010, he became an Assistant Professor for Robust Signal Processing and a Full Professor for Communication Systems in 2013 at the Department of Electrical Engineering and Information Technology, Darmstadt University of Technology, Darmstadt, Germany. His research interests are in the area of robust signal processing and adaptive beamforming, high resolution sensor array processing, multiantenna and multiuser communication systems, distributed, sparse and mixed-integer optimization techniques for signal processing and communications, statistical signal processing, spectral analysis, parameter estimation. Dr. Pesavento was a recipient of the 2003 ITG/VDE Best Paper Award, the 2005 Young Author Best Paper Award of the IEEE Transactions on Signal Processing, and the 2010 Best Paper Award of the CROWNCOM conference. He is a member of the Editorial board of the EURASIP Signal Processing Journal, an Associate Editor for the IEEE Transactions on Signal Processing. He currently is serving the 2nd term as a member of the Sensor Array and Multichannel (SAM) Technical Committee of the IEEE Signal Processing Society (SPS).