

A Focus on Compressive Sensing Applications in Measurement

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Compressive sensing, or compressed sampling (CS), has been hailed as a revolutionary breakthrough in signal processing, sensing and measurement. Still, newcomers to the field may find it hard to get a feeling for the approach, without finding themselves entangled at once in rather complex mathematics. This tutorial aims to reverse the situation, starting with a focus on compressive sensing applications and on the practical implications of the assumptions underlying the CS paradigm. The speakers will first provide an intuitive understanding of the basic concepts behind a successful implementation, then progress to a more in-depth analysis of significant factors in the development of effective CS-based algorithms and devices and, finally, discuss when and how measurement applications can benefit from CS. The tutorial is based on several years experience in the analysis of measurement problems from a CS viewpoint and in the development of CS-based application algorithms. This allows to explore connections between CS theory and measurement science, which helps present the topic in a way that should prove accessible to most researchers and practitioners in instrumentation and measurement.