Lecture: 'Make Sensing Smart: smart data rather than big data'

Data: mércores, 10 abril, 2019 -12:00 - 14:00

Lugar: CiTIUS Assembly Hall

Poñente(s): Otmar Loffeld (Research Center of Sensor Systems (ZESS))

Idioma: Inglés

Streaming: Non

After introducing ZESS (Center for Sensorsystems) highlighting the methodological research areas and presenting some application examples, putting a focus on remote sensing and bistatic SAR, the lecture will propose a candidate for a unifying theory to sensing, sensor signal processing and high level information extraction in form of a combination of Compressed Sensing and Bayesian estimation.

After a short introduction of some basics of Compressed Sensing, the lecture will concentrate on the potential of the nullspace – doing l1 minimization in the nullspace of the sensing matrix. It will present a Kalman filter based approach to the solution of this minimization problem and by comparison with other classical reconstruction algorithms, demonstrate the feasibility and efficiency of the approach. As an application example the lecture will shortly present some results of Inverse SAR Imaging utilizing only a small percentage of the available raw data. Subsequently the scope will be widened to the general case of mono – or bistatic SAR imaging, highlighting the “curse of exploding dimensionality” and point out strategies to overcome these problems. Finally some conclusions will be given.

About

Otmar Loffeld received the Diploma degree in Electrical Engineering from the Technical University of Aachen in 1982, the Dr. Eng. degree and the “Habilitation” in the field of digital signal processing and estimation theory in 1986 and 1989, respectively, both from the University of Siegen. In 1991, he became Professor for digital signal processing and estimation theory at the University of Siegen. He lectures on General Communication Theory, Digital Signal Processing, Stochastic Models and Estimation Theory and Synthetic Aperture Radar, and is author of two textbooks on estimation theory. In 1995, he joined the Center for Sensorsystems (ZESS) at the University of Siegen and became the chair in 2005.

In 1999, Prof. Dr. Loffeld became Principal Investigator (PI) on Baseline Estimation for the X-Band part of the Shuttle Radar Topography Mission (SRTM), to which ZESS contributed to DLR’s baseline calibration algorithms. He is a PI for interferometric techniques in the German TerraSAR-X mission, anda PI for a bistatic spaceborne airborne experiment, where TerraSAR-X serves as the bistatic illuminator while FGAN’s PAMIR system mounted on a Transall airplane is used as a bistatic receiver.

In 2002, he founded the International Postgraduate Program (IPP) “Multi Sensorics,” and in 2008 established the “NRW Research School on Multi Modal Sensor Systems for Environmental Exploration and Safety (MOSES)” at the University of Siegen.

His current research interests include multisensor-data fusion, Kalman filtering techniques for data fusion, optimal filtering and process identification, SAR processing and simulation, SAR interferometry, phase unwrapping, baseline estimation and, recently, bistatic SAR processing. He is a member of the ITG/VDE and Senior Member of the IEEE/GRSS