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Seminar

Multidimensional Signal and Color Image Processing Using Lattices: An Overview

Speaker : Dr. Eric Dubois, LFIEEE (Professor Emeritus, School of EECS)

Date : Thursday, 20th February 2020

Time : ~~11AM~~ 2PM

Venue : STE F0126

Abstract : A multidimensional signal is any information-bearing function of two or more independent variables, such as space and time. The signal value can be a scalar or vector quantity, perhaps a tensor. This talk gives an overview of the approach to this topic presented in my 2019 book, which is largely based on lattices (where the term lattice is used in the same sense as crystal lattice). Lattices are used to describe sampling structures for discrete-domain signals and to specify periodicity for periodic signals. The book mainly focuses on color images and videos as examples, but the theory is applicable to a wide variety of multidimensional signals in medical imaging, acoustics, geophysics, etc. The talk will highlight novel approaches the book has taken to treat this topic that differentiate it from other works and will summarize some of the original contributions. Topics addressed include the processing of color images, multidimensional filter design, change of sampling structure, and symmetry-invariant signals and systems.

Reference: Eric Dubois, *Multidimensional Signal and Color Image Processing Using Lattices*, John Wiley & Sons, 2019.