EURASIP SEMINAR REPORT

Abstract

The EURASIP one-day seminar on *Block Matching 3-D (BM3D) image modeling and novel variational image reconstruction techniques* was presented by Professor Karen Egiazarian and Vladimir Katkovnik, Department of Signal Processing, Tampere University of Technology, Finland. The seminar was held on the 02/05/2012, promoted and organized by Marco Carli (University of Roma TRE) at the University of Roma TRE, Roma, Italy.

The topic of the key talk was about the use in nonlocal imaging techniques of novel methods for blocks (patches, fragments) similarity matching. This sort of techniques appear independently and in parallel in a number of different developments, in particular, as patch-matching proposed for video processing and as nonlocal means (NL-means) in nonparametric regression modeling. A few recent years witness an intensive flow of publications with ideas and techniques based on various nonlocal approximations. Some of these nonlocal developments report very good and sometimes even extraordinary good performance. While this sort of improvements are not fully understood and theory of these methods is far from being developed, the source of this advanced performance is clear as it originated from the fact that real-life images are characterized by multiple similarity of their fragments. A proper use of this similarity results in the efficiency which is reported in publications. A family of the Block Matching 3-D (BM3D) algorithms has been proposed within the framework of nonlocal patch-wise image modeling in transform domain. It has been recognized that these algorithms are very successful for basic imaging problems: denoising, deblurring, super-resolution still and video imaging. The speakers presented a novel frame interpretation of the analysis and synthesis of BM3D. These frames provide new tools for variational formulation of imaging problems.
The talk was attended by 70 people.
At the end of the talk an intense discussion took place, several questions from the audience were raised and strong interaction with the speakers occurred.
The slides are available at EURASIP website; other material, articles, demos, and software, can be found from the link http://www.cs.tut.fi/~lasip/