IRIT

*Informatics Research
Institute of Toulouse*

Seminar

Friday 6 July 2018
11h00 – 12h00
UT3 Paul Sabatier, IRIT, Auditorium J. Herbrand

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Non-linear approaches based on the maximum distance — a pseudo morphology and PCA approximation for color, multispectral and hyperspectral data/image analysis

Abstract: In the context of complexity assessment and texture image characterization for color natural and fractal images, we start by introducing a probabilistic pseudo-morphology based on the Chebyshev inequality. We present our experimental results on complexity assessment by fractal measures, as well as image segmentation based on tailored texture features. Further on, we propose a maximum-distance-based pseudo-morphology and show that extending the existing morphological approaches for texture characterization from grayscale to color and to multispectral images in a straight-forward way is not able to make full usage of the spectral information acquired by the sensors. Then the same maximum distance is used for developing a non-optimal geometric approximation of the principal component analysis (PCA). We validate this approach on synthetic 2D data and show its usefulness for the visualization and analysis of hyperspectral images. We conclude on how outliers of a multivariate data set can provide information compared to the majority, as in classical statistics.

Short bio: Mihai Ivanovici holds a PhD in electronics from Politehnica University of Bucharest, Romania. He is a full professor at Transilvania University of Brasov, Romania (UTBv), within the Department of Electronics and Computers. He is head of Multispectral Imaging and Vision (MIV) Laboratory (http://miv.unitbv.ro), coordinator of the C13 Research Centre "Integrated Electronic Systems and Advanced Communications" within the R&D Institute of UTBv and vice-dean of research for the Faculty of Electrical Engineering and Computer Science within UTBv. He is a member of the IEEE Signal Processing and IEEE Geoscience and Remote Sensing societies. His research interest and expertise are in the field of color and multispectral image acquisition, processing and analysis. Currently he is supervising two PhD students and mentors two post-doctoral students.

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