

EDITORIAL

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This volume of *Computación y Sistemas* has joined five papers and a Ph.D. thesis summary, all of them with a solid mathematical basis.

Three of the five papers show very interesting researches in the area of graphics and image computer processing.

The paper by Rivas-Araiza, Mendiola-Santibanez, Herrera-Ruiz, González-Gutierrez, Trejo-Perea y Ríos-Moreno, entitled “Mejora de Contraste y Compensación en Cambios de la Iluminación”, presents a new operator for contrast improvement in digital images with undesired shadows due to a deficient illumination. The operator is based on the Weber Law, requiring the detection of the image background. This is achieved by the analysis of the regional minima obtained by the morphological closure by reconstruction. The experiments in the paper prove the effectiveness of the method for images with high variations in illumination.

The paper “Normalization of a 3D-Shape Similarity Measure with Voxel Representation”, authored by Sánchez-Cruz and Rodríguez-Dagnino, proposes a method for the determination of similarity between pairs of 3D figures in a set. The metric computes the work to be done in the transformation of one figure into another one, as the distance from the set of voxels in one figure to the voxels in the other, once the mass centers and their principal axis have been aligned. A method is also proposed for the normalization of the metric. The main advantage of this method when compared to others is its low sensitivity to noise, and the fact that it provides information about the shape and compactness of the figure.

With a somehow similar goal we find the paper by Felipe, Ramos, Suárez and Gutierrez entitled “Selective Conditional Enhancement of Digital Color Halftone Images”, proposing a procedure called Conditional Selective Enhancement for the enhancement of images obtained from the digitizing of color images printed in halftones. The method is based on the application of eight heuristic rules that consider the pixels in colors with a high occurrence rate as valid and the pixels with low occurrence rate as artifacts. In this way, the artifacts are minimized, preserving the structures and borders, and retaining the colors which are more similar to the ones in the original image. The enhanced image is then more suitable for computer analysis, making it possible the use of colors as valid indicators in recognition processes.

With a very different orientation we find the work of Fernandez-Vazquez and Jovanovic-Dolecek, entitled “Design of Linear Phase IIR Filters with Flat Magnitude Response Using Complex Coefficients Allpole Filters”, presenting a method for the design of IIR (Infinite Impulse Response) filters with linear phase and flat magnitude response (useful for the design of filter banks and for the design of IIR filters with improved group delay). The solution is based on the use of auxiliary allpole filters with complex coefficients. An advantage of this method is that the parameters to be used in the design are the same as in traditional IIR filter design. Moreover it is a direct method, not requiring the design and transformation of analog filters.

Finally, the paper by Melchor Aguilar and Castillo Torres entitled “Stability Análisis of Proporcional-Integral AQM Controllers Supporting TCP Flows”, focuses on a certain kind of models for the description of the behaviour of AQM (Active Queue Management) controllers in TCP networks, namely the fluid-flow model with proportional-integral (PI) controllers. For them, the authors establish the necessary and sufficient conditions for the asymptotic stability of the closed-loop linearization; they also obtain the complete set of PI controllers that locally stabilize the equilibrium point, and they also analyze the robustness of the controllers to uncertainties in the network parameters.

The Ph.D. thesis entitled “Growth Evaluation of a Conifer Forest (*Pinus Cooperí Blanco*) using a Neural Net Backpropagation Trained with Distance Independent Competition Measures” presented by Celis Porras in 2006, is an interesting application of neural networks for the simulation and prediction of the growth in diameter and altitude of a *Pinus Cooperí Blanco* forest. The training of the network is based on a set of distance independent competency indexes, reflecting the competence among trees for available resources. The empirical results prove a high degree of accuracy in the predictions.

All of these works are an interesting demonstration of how Computer Science progresses both theoretical and practically, with very interesting researches and applications in so diverse domains such as graphic and image processing, computer networks, filter design, or even in problems apparently so far from computing like predicting the evolution of a forest.

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