
Editorial

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Biographical notes: Samuel P. Kozaitis received a PhD in Electrical Engineering from Wayne State University in 1986. He joined the Florida Institute of Technology in 1988 where he is currently the Department Head and Professor of Electrical and Computer Engineering. He also worked for Wayne State University, the US Air Force Photonics Center at Rome Laboratory, General Motors Research Laboratory, NASA-Kennedy Space Center and as a consultant for several government agencies and industry. His current research emphasis involves the development of algorithms to reduce noise in imagery and automatically detect important features. He also serves on several technical committees for professional conferences of SPIE and IASTED worldwide. He won the outstanding faculty service award at Wayne State University.

Welcome to the second issue of *Journal of Signal and Imaging Systems Engineering (JJSISE)*. We acknowledge the importance and the complexity of systems engineering of working signal and imaging systems; therefore, state-of-the-art systems analysis, design, integration, evaluation, benchmarking and standardisation along with the development of new algorithms evaluated towards building such systems are the primary focus of *JJSISE*.

The objective of this special issue on denoising is to establish an effective communications channel between researchers, developers, and professionals from both academia and industry so that they can report on the latest scientific and theoretical advances on applied signal and imaging systems and evaluate real world state-of-the-art-systems.

Many problems in signal processing, communications, and information theory are related to noise. Although the concept of denoising is one that has been around for some time, new and existing applications require innovative solutions. There are many algorithms for automatically detecting or extracting features from a signal. But, when noise is present, their performance usually dramatically decreases. In addition, removing noise is not the complete story. Often, a feature in a corrupted signal must be extracted for a particular application. Therefore, the integrity of the denoised feature with respect to an application is often the most important factor of an algorithm.

Wavelets provide a useful framework for many denoising approaches. Wavelets represent ideas that are common to several disciplines that have been independently developed. Although they are a recent development with regards to reducing noise, wavelets have become a

useful tool leading to efficient solutions of problems. This special issue of the *Journal of Signal and Imaging Systems Engineering* focuses on recent developments and highlights progress in industrial settings. In the paper on wedgelets, a new adaptive geometrical multiresolution technique of image denoising is proposed. It represents a different approach to image approximation, especially for images with well-defined geometry. In an application to steganography, a genetic algorithm is used to avoid drawing suspicion to the transmission of a hidden message in a signal. In another application higher-order statistics are used with denoising to more accurately detect important features from ECG signals. In more industrial applications, control chart pattern recognition is a critical task in statistical process control. The paper on this subject detects unnatural patterns that may occur in process data indicating that the process is out-of-control. Another industrial application is related to fusion of infrared and visual imagery. By using a new mathematical construct followed by denoising, improved results can be achieved. Multiplicative noise is present in images obtained with coherent radiation. The papers on denoising of ultrasound imagery and phase unwrapping of synthetic aperture radar imagery represent an interesting area with many more applications and potential. Although there are numerous methods that can be used for denoising, there are many more applications awaiting their application.

As guest editor, I hope that the papers in this issue will stimulate further research in denoising because I believe that the best is yet to come. I am particularly grateful to the authors for their contributions and to the reviewers who provided insightful and thorough comments.