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Digital Image and Signal Processing for Measurement Systems

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Description:

This book provides an overview of advanced digital image and signal processing techniques that are currently being applied in the realm of measurement systems. The book is a selection of extended versions of the best papers presented at the Sixth IEEE International Workshop on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications IDAACS 2011 related to this topic and encompass applications that go from multidimensional imaging to evoked potential detection in brain computer interfaces. The objective was to provide a broad spectrum of measurement applications so that the different techniques and approaches could be presented.

Digital Image and Signal Processing for Measurement Systems concentrates on signal processing for measurement systems and its objective is to provide a general overview of the area and an appropriate introduction to the topics considered. This is achieved through 10 chapters devoted to current topics of research addressed by different research groups within this area. These 10 chapters reflect advances corresponding to signals of different dimensionality. They go from mostly one dimensional signals in what would be the most traditional area of signal processing realm to RGB signals and to signals of very high dimensionality such as hyperspectral signals that can go up to dimensionalities of more than one thousand.
The chapters have been thought out to provide an easy to follow introduction to the topics that are addressed, including the most relevant references, so that anyone interested in this field can get started in the area. They provide an overview of some of the problems in the area of signal and image processing for measurement systems and the approaches and techniques that relevant research groups within this area are employing to try to solve them which, in many instances are the state of the art of some of these topics.

Contents:

Preface. 1. Subject-Adaptive Steady-State Visual Evoked Potential Detection for Brain-Computer Interface, by N. Chumerin, N. Manyakov, A. Combaz, A. Robben, M. van Vliet, M. Van Hulle. 2. Ventricular activity cancellation in ECG using an adaptive echo state network, by A. Petrenas, V. Marozas, A. Lukosevicius. 3. Optimal Quality-Aware Predictor-Based Adaptation of Multimedia Messages, by S. Pigeon, S. Coulombe. 4. Comparison of Improved Methods for Tracking Movements of IPMC Actuators, by K. Tsiakmakis and T. Laopoulos. 5. Photoplethysmography Detection by Smartphone's Videocamera, by D. Grimaldi, Y. Kurylyak, F. Lamonaca. 6. Detection and Classification Device for Malaria Parasites in Thick-blood Films, by S. Kaewkamnerd, A. Intarapanich, M. Pannarat, S. Chaotheing, C. Uthaipibull, S. Tongsimav. 7. Face Detection and Tracking Framework for Video Processing, by I. Paliy, A. Sachenko, O. Boumbarov. 8. Special Areas Detection on Agricultural Fields Images Using Evaluations of Local Brightness Variability, by R. Sadykhov, A. Doudkin, V. Ganchenko, A. Petrovsky, T. Pawlowski. 9. Towards Real-time Hyperspectral Image Processing, a GP-GPU Implementation of Target Identification, by D.B. Heras , F. Argüello, J. López Gómez , B. Priego, J.A. Becerra. 10. Time in Hyperspectral Processing: a Temporal based Classification Approach, by B. Priego, D. Souto, F. Bellas, F. Lopez Peña, R.J. Duro.

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