

## GUEST EDITORIAL PREFACE

# Special Issue on Instrumentation, Communication, Information Technology, and Biomedical Engineering

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This special issue contains a selection of interesting contribution from researchers. Partly of the articles that have been presented in the International Conference on Instrumentation, Communication, Information Technology, and Biomedical Engineering (ICICI-BME) 2011 in Bandung, Indonesia.

In the first article, *Performance Evaluation of Color Retinal Image Quality Assessment in Asymmetric Channel VQ Coding*, Agung W. Setiawan, Andriyan B. Suksmono, Tati R. Mengko, Oerip S. Santoso, explore the retinal image characteristics to construct a more suitable image coding system. The coding processes are conducted in three schemes: weighted R channel, weighted G channel, and weighted

B channel coding. From Structure Similarity (SSIM), and Visual Information Fidelity (VIF) graphs, they can conclude that G channel has more important information than two other channels. Experiment with actual retinal image shows that the minimum value of SSIM and VIF required in this coding scheme is 0.9940 and 0.8637.

The second article, *A Portable Infection Screening System Designed for Onboard Entry Screening Based on Multi-parameter Vital Signs*, Guanghao Sun, Nguyen Quang Vinh, Shigeto Abe, Osamu Takei, Masami Sugamata, and Takemi Matsui, has developed a portable system designed for onboard entry screening using linear discriminant analysis. The system

automatically discriminates infected individuals from normal subjects using measured heart rate, respiratory rate, as well as facial surface temperature is determined by thermography. The results showed sensitivity of 100% and specificity of 88%. The system seems to be promising for onboard infection screening to safeguard public health.

The third article, *Tracking of Markers for 2D and 3D Gait Analysis using Home Video Cameras*, S. Mihradi, Ferryanto, T. Dirgantara, and A.I. Mahyuddin, have developed an affordable optical motion-capture system which uses home video cameras for 2D and 3D gait analysis. The system consists of two camcorders with speed of 25 fps, a flash, LED markers, two PCs and technical computing software to track the motions of markers attached to the human body during walking. The experimental results show that although only two cameras with speed of 25 fps are used, the system is able to track movement of markers in 2D and 3D space and reconstruct markers positions in real coordinate.

In the fourth article, *Design and Construction of Thermally Combined Microcurrent Electrical Therapy Device as Preliminary Study for Rheumatoid Arthritis Treatment*, Yuda G. Hadiprodjo, Aulia A. Iskandar, and Tutun Nugraha, have combined two different therapeutic modalities: Microcurrent Electrical Therapy (MET) and thermal therapy, which will be called as Thermally combined Microcurrent

Electrical Therapy (T-MET) device for Rheumatoid Arthritis (RA) patient. For MET, the resulted output is a square wave with fix 50% duty cycle adjustable frequency (0.31 - 100Hz), and adjustable current amplitude (36 - 466 $\mu$ A). For thermal treatment, two different modes are provided: heating mode (up to 40° C) and cooling mode (up to 15° C).

Finally, in the last article, *Design of a Decision Support System for a Home Telehealth Application*, Mas S. Mohktar, Kezhang Lin, Stephen J. Redmond, Jim Basilakis, and Nigel H. Lovell, have developed a decision support system (DSS) to manage patients with chronic obstructive pulmonary disease (COPD) using a home telehealth system. The DSS has been developed to assist home telehealth clinical support staff with their workload, and to provide more effective communication between home users of some telehealth.

I sincerely hope this issue will enable us to continue meeting the expectations of our readers and contributors. Finally, once again, I thank all the contributors for publishing through this journal.

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