

The Nightingale Prize for best MBEC paper in 2011

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The Nightingale Prize is named after Alfred Nightingale who was the first Editor in Chief of Medical and Biological Engineering and Computing, MBEC. He died in 1963 at the age of 40 [17]. He was a promising scientist and pioneer in the field of electromyography [14]. The prize was established in cooperation between the Institute of Physics and Engineering in Medicine¹ and the International Federation of Medical and Biological Engineering².

Since biomedical engineering papers do not collect citations so fast to allow citation frequency to be used as a selection criterion [12, 18] and the Nightingale prize is intended to recognize a recent paper an alternative procedure was established. The manuscripts that received a priority of 90 % or higher from the reviewers were selected with the exclusion of reviews and original papers with a rather senior author. The final list consisted out of 10 papers that will be recognized by this editorial.

The selected winning paper of this year is by Sigal Portnoy, Nicolas Vuillerme, Yohan Payan and Amit Gefen from the department of Biomedical Engineering, Tel Aviv University, Israel. The paper is entitled “Clinically oriented real-time monitoring of the individual’s risk for deep tissue injury” [13]. This is one of the rare submissions where both reviewers not only gave a high score but recommended accept after first reading. The study aimed to formulate a patient-specific biomechanical model that can help in the continuously monitoring of internal tissue stresses in real time based on surface pressure data obtained from paraplegic patients in a wheelchair. The

feasibility was tested on real patient data. It is the combination of state of the art numerical modeling and clinical verification that makes this manuscript to a nice example of quality biomedical engineering publication. The reviewers acknowledged that the paper reports on important work in the translation of engineering to clinical science in pressure ulcer prevention.

Several papers related to the cardiovascular system were on the short list. Cardiac resynchronization therapy is important in preventing failure of the heart and for this the position of the coronary sinus, CS, lead is important. Corsi et al. [1] developed a method for quantifying CS lead position in the 3D domain throughout the cardiac cycle at implant and at follow-up using chest fluoroscopy. Transesophageal left ventricular electrogram-recording and temporary pacing was developed to improve patient selection for cardiac resynchronization by Heinke et al. [6]. The cardiorespiratory synchrogram is a stroboscopic-based graphical tool for evaluating phase-locking between cardiac and respiratory oscillators. This method was improved by including an adaptive delay in the cardiac oscillator by Kabir et al. [9]. Sola et al. [16] presented first experimental evidence that electrical impedance tomography is capable of measuring pressure pulses directly within the descending aorta and thereby opens the way to an unsupervised method for arterial blood pressure measurement. Westerhof et al. [19] reconstructed aortic pressure from 24-h intra-brachial and simultaneously obtained non-invasive finger pressure in hypertensive and normotensive patients. From these registrations, it was concluded that cardiac oxygen supply is compromised during the night in hypertensive patients.

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¹ http://www.ipem.org.uk/ipem_public.

² <http://ifmbe.org/>.

The other papers in the short list were all focused on very important issues. Microdialysis can be used in parallel to deep brain stimulation (DBS) to relate biochemical changes to the clinical outcome. Diczfalusy et al. [2] developed a finite element method to predict the tissue volume of influence and to visualize this volume in relation to patient anatomy. The visual system offers a unique possibility of experimental manipulation of stimulus size-related increases of the spatial extent of cortical activation. This was studied using magnetoencephalography by Golubic et al. [4].

The last but not least paper on the short list appeared as original article in the special issue ‘Trends in rehabilitation robotics’ [3]. A new method was proposed for providing assistance during cyclical movements by Ronsse et al. [15]. This method is trajectory-free in the sense that it provides assistance irrespective of the performed movement and requires no other sensing than the assisting robot’s own encoders.

This will be the last time that as editor in chief I have the pleasure to announce the yearly Nightingale Prize. The topics that are covered by the winning papers over the last 6 years demonstrate that MBEC aims to serve the Biomedical Engineering community at large. This is also demonstrated by the countries where the winners came from Denmark [11], Australia [7], Taiwan China [8], Canada [10], Spain [5] and now Israel [13]. The editors see this as a healthy sign that the journal serves as a medium for state of the art research in traditional and emerging fields as it develops over the many countries that are also represented in the IFMBE.

On behalf of the editors, IPREM and IFMBE, I wholeheartedly congratulate the winner of the Nightingale Prize 2011. However, also the other top scorers should be congratulated with their excellent contributions.

As always, we are grateful to IPREM and IFMBE for maintaining the Alfred Nightingale Prize.

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