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The Nightingale Prize 2011 for best MBEC paper in 2010

Jos A. E. Spaan

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The first Editor in Chief of Medical & Biological Engineering & Computing, MBEC was Alfred Nightingale. In 1963, he died at the age of 40 and therefore has not seen much of his accomplishments for the journal [16]. He was a promising scientist and pioneer in the field of electromyography [12]. In his honor, the Nightingale prize was established in cooperation between the Institute of Physics and Engineering in Medicine¹ and the International Federation of Medical and Biological Engineering.²

The Nightingale prize is intended to bring a paper that has been published recently to attention. Biomedical engineering papers do not collect citations so fast to allow citation frequency to be used as a selection criterion [10, 17]. Hence, we selected those that received a priority of 90% or higher from the reviewers [18]. We excluded papers from the special issue [9]. The final list consisted out of 10 papers that will be highlighted by this editorial.

The selected winning paper of this year is by Carlos Guerrero-Mosquera, Armando Malanda Trigueros, Jorge Iriarte Franco and Ángel Navia-Vázquez from the department of Signal Processing and Communications, University Carlos III of Madrid, Madrid, Spain. The paper is entitled: New feature extraction approach for epileptic EEG signal detection using time–frequency distributions [6]. One of the reviewers wrote: “The main strength of the paper is that it presents a new method for reliable automatic detection of an epileptic seizure from EEG signals, taking into account the computational cost of the method applied. Special attention was paid to the removal of

artifacts in order to distinguish between real epileptic seizures and artifacts during non-epileptic events.” In selecting this paper from Carlos Guerrero-Mosquera et al. as the winner, the clinical applicability of the study has played a role.

MBEC is the journal of the International Federation of Medical and Biological Engineering and aims to serve the Biomedical Engineering community at large. This is also apparent from the wide variety of areas represented in the shortlist for the Nightingale prize. Although some disciplines are traditionally strongly represented other disciplines come in waves such as the recent one on sleep disorders [2]. The editors see this as a sign of health of the Journal since apparently we serve as a medium for rather actual research topics that have difficulty in finding the right subspecialty journal. However, also the broader audience that is reached by our journal may be a reason of selecting MBEC as the journal of choice.

Several papers related to the cardiovascular system were on the shortlist for the Nightingale prize. Biventricular pacing has become an established method for the treatment of heart failure and the paper of Di Molfetta et al. [4] contributes to its effectiveness by comprehensive numerical modeling. The ECG remains an important signal for patient monitoring also during interventional MRI procedures. However, the ECG signal can be strongly affected by gradients-induced artifacts. Sansone et al. [13] analyzed the performance of a specific filtering technique to overcome these problems. With the application of vein grafts, it is important to have quantitative knowledge on focal intimal hyperplasia since this leads typically to graft stenosis. Such a quantitative method was achieved by Franz et al. [5]

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¹ (http://www.ipem.org.uk/ipem_public).

² (<http://ifmbe.org/>).

via a constraint-based cluster analysis. The paper of van Horssen et al. reports on improvements on the detection of fluorescent microspheres and cast material for the quantification of the structure of the coronary vascular bed by an imaging cryomicrotome [20], an instrument that was first described in MBEC [19]. An interesting paper addressed the modulation of a heart rate variability by listening to music [11].

The other papers in the shortlist where all focused on very important issues. In muscular disorders, single muscle fibers are successively lost during the progress of the disease noticeable by an increased fiber diameter variation, fibrosis, and perifascicular atrophy. Istenič et al. [7] developed a method for automated surface EMG classification of such disorders based on a multi-scale entropy-based approach. Temperature reduction of only 1–2°C in the brain tissue has the potential to preserve brain function and protect against ischemic injury. Smith and Zhu [14] provided a theoretical analysis of brain hypothermia induced by cold spinal fluid applying a torso cooling pad.

In elderly, paralyzed, and immobilized patients pressure ulcers form a serious risk for skin damage which may result in severe complications. Sopher and Gefen [15] modeled the effects of skin wrinkles, age, and wetness on mechanical loads in the stratum corneum aiming at understanding the parameters in ulcer development such as frictional force and shear stress. Last to discuss but not the least in terms of judgment is the paper of Joshi and Hu [8] on electroporation focusing on pore shape due to ultrashort electrical pulsing. Electroporation is a topic that has received attention in the journal and probably will attract more papers in the coming years because of its increasing clinical applicability [1, 3].

On behalf of the editors, IPPEM 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 IPPEM and IFMBE for maintaining the Alfred Nightingale Prize.

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