J Bioengineer & Biomedical Sci 2016, 6:5 (Suppl)
http://dx.doi.org/10.4172/2155-9538.C1.015



## The philosophical aspects in modern biomedical engineering advancements

**I A Shogar**
International Islamic University Malaysia, Malaysia

This paper investigates the philosophical aspects in modern bioengineering and its role in harnessing potentials of bioengineering research. Biomedical engineering as an ultimate mechanism to transform knowledge for healthcare purposes has made a tremendous advancement in the last few decades. The dramatic breakthroughs made in this field has posted philosophical questions and shifted the attention to its future directions. In fact, bioengineering is increasingly articulating itself as an interdisciplinary field and claiming its capability of becoming the Science of the 21st century for environmental care and human needs. Biomedical engineering is a basic form of bioengineering science that composed of several disciplines, such as genetic engineering, biostatistics, bioinstrumentation, biomaterial, imaging, biomechanics, biosystem, biotransformation, clinical engineering and rehabilitation engineering. The common objective of biosciences is to understand the complex systems of life for practical purposes, especially for human and environmental healthcare. The terminal goal of biomedical engineering, however, is to improve the quality of life and reduce the impacts of illness on human health through effective diagnostic technologies and proper intervention methods. It also provides an appropriate infrastructure for engagement with bioengineering research. No doubt, application of the quantitative method of modern science has played a major role in advancements of bioengineering science. However, to harness potentials of bioengineering science, achieving its final goals, and to maintain the current advancements of biomedical research, bioengineers need to be acquainted with the philosophical questions on the nature, method, function and the final objectives of bioengineering. What is the most effective method for holistic biomedical research?; How philosophy can play a practical in the advancements of modern bioengineering?; How the current deadlock in the development of new drugs can be overcome?; And why do the 'complementary' and 'alternative' medicine are increasingly flourishing in modern societies? Modern bioengineers should be acquainted to deal with such questions. It is the basic assumption of this paper that the philosophical aspects that may contribute in the advancement of science, generally and specifically in the progress of biomedical engineering, can be identified in the following categories: conceptual; epistemological; methodological; and ethical. The present paper aims at elaborating these categories. The analytical method adopted in the paper clearly emphasizes the qualitative approach that is relevant to the medical philosophy.

shogar@iium.edu.my

## Quantifying skin stretch induced motion artifact from an electrocardiogram signal

**Anubha Kalra**
Auckland University of Technology, NewZealand

This work presents a 2D quantification of strain field caused due to the motion artifact in an Electrocardiogram (ECG) measurement. The objective of this work is to estimate the skin stretch induced motion artifact in an ECG signal. An ECG measurement was obtained from a subject for 10 seconds using standard Ag/AgCl electrodes by continuously moving the arm back and forth during the measurement. The motion artifact produced due to the arm movement was emulated using a Poly dimethyl siloxane (PDMS) patch of dimensions 40 mm x 45 mm x 0.254 mm adhered to the arm. The movement of the PDMS patch during the ECG measurement was recorded in a video and motion artifact was quantified in terms of normal and shear strain components εx, εy and εxy. These values were derived using feature detection and Euclidean distance feature mapping. The obtained motion artifact can be eliminated from the ECG signal using adaptive filtering or other techniques such as extended kalman filtering (EKF). This method of evaluation of the strain components was validated against a finite element analysis SolidWorks®.

akalra@aut.ac.nz