

**A seminar for the promotion of  
“Engineering for Better Quality of Life” programme –  
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**HKIE Nuclear Division**



**Institution of Engineering and Technology**



**Institute of Measurement and Control – Hong Kong Section**



**The Society of Operations Engineers Hong Kong Region**



**The Hong Kong Ergonomics Society**

**Title:** Contribution of biomechanical study on better quality of sports shoes

**Speaker:** Prof. Youlian Hong, Department of Sports Science and Physical Education, The Chinese University of Hong Kong

**Date and Time:** May 19, 2008, 7:00 - 8:00 p.m.

**Venue:** LT2, Sino Building, The Chinese University of Hong Kong

**Abstract:**

The World Health Organization (WHO) mentioned that one of the most important indicators of the quality of life is health. Health can be improved by exercise and sports because of their beneficial effects in both physical and mental aspects. With the increasing awareness on health and quality of life, therefore, more and more people are increasingly becoming active in their participation in sports and exercise. In this regard, athletic shoes do not only play a role in men-women sports but also serve the overall population in general. Good quality of sports shoes provides the wearer comfort, better performance, and protection from injuries. To produce good quality of sports shoes is therefore the thrust of innovative biomechanical technology.

One of the key factors related to shoe function is shoe last design. In this regard, biomechanical technology has considerably contributed to designing better last. The three-dimensional image

analyses made in this study revealed the differences in foot morphology of the Chinese and Caucasians, both males and females. For a fact, foot shape changes as people grow and age. In addition, the analysis made in the study also suggested a shoe last design that can fit majority of the population.

Biomechanical technologies have been developed to determine the functional properties of sports shoes: comfort, fitting, protection, plantar force distribution, sensation, among others. Prototype shoes are tested to determine whether the original concept of a desired function has been reached. Tests and re-tests not only result to better designs that in turn ultimately benefit consumers. In fact, substantial costs are also saved and industry losses are avoided with the prevention of poor pairs of shoes from reaching the market.

The unique contribution of biomechanical technology is the provision of scientific advice and guidance to consumers as they select the most suitable pairs of shoes for specific purposes. Examples of questions that are addressed are the following. Do expensive shoes perform better than less expensive ones? Do visually effective “high-technology” shoes perform better than traditionally designed ones? What are the differences in function among different kinds of sports shoes? Even more specific, what are the biomechanical differences of running on a treadmill and on level ground, or what are the effects of running on surfaces on human movement pattern?

The biomechanical research can benefit both the footwear industry and sports shoe consumers.

**Presented by:**

Department of Sports Science and Physical Education, The Chinese University of Hong Kong. On behalf of Hong Kong Ergonomics Society.

