

RESEARCH INSTITUTIONS: HONG KONG POLYTECHNIC UNIVERSITY

Thanks to generous funding from the Hong Kong government, the Institute of Textiles and Clothing at the special administrative region's Polytechnic University has been able to embrace a whole series of cutting-edge projects with a firm focus on sports.

Hong Kong comes up with the money

A measure of people believe Hong Kong is a city searching for a purpose. There's evidence to support this. Perhaps the most compelling is that the Hong Kong government is ready, willing and (unusually in these difficult economic times) able to offer financial support to a host of research and development projects.

There is nothing new under the sun, so it should come as no great surprise to find that one substantial project under way takes Hong Kong back to the industry upon which much of its success was founded.

The project is funded by the government's Innovation Technology Fund (ITF), administered by the Innovation and Technology Commission, which aims to increase the added value, productivity and competitiveness of Hong Kong's economic activities. The hope (that's their word) is that, through the ITF, Hong Kong companies can be encouraged and assisted to upgrade their technological level and introduce innovative ideas to their businesses.

One particular project, partially completed and still ongoing under the bureaucratic title, IT/014/08TP, relates to High-Performance Sportswear and Devices. This is being conducted by the Hong Kong Research Institute of Textiles and Apparel Limited, based at the Hong Kong Polytechnic University (HKPU), under the direction of Professor Yi Li of the HKPU's Institute of Textiles and Clothing (ITC). It is largely funded by the ITF with a grant of \$590,000.

The project was developed in response to requests from the industry. It aims to design and develop high-performance sportswear and devices that are identified to have good market potential by industrial sponsors or partners.

Hong Kong Polytechnic University.

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This is an applied research project with the focus on product design innovations and scalable technology innovations on the basis of extensive research in textile bioengineering and a number of patented inventions from the research team.

Tangible deliverables include:

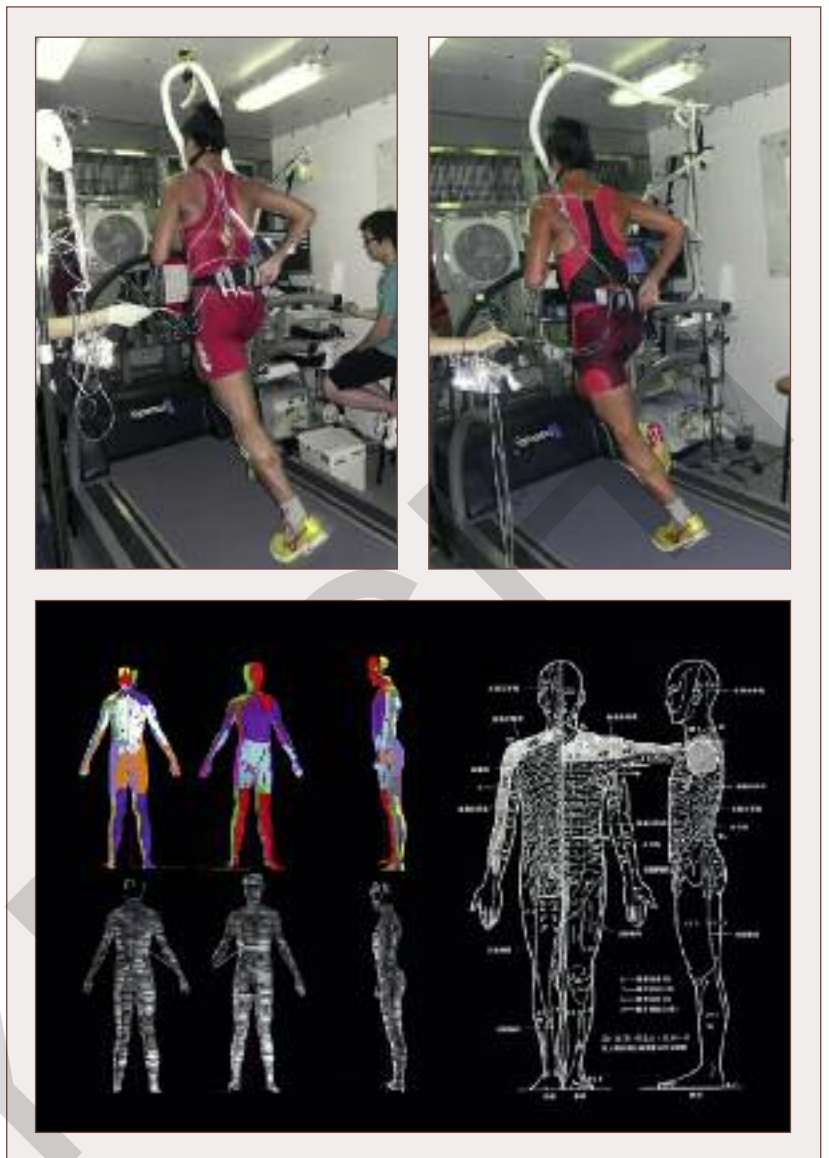
- three series of novel, high-performance sportswear and or devices for sports will be invented, including winter running wear, summer running wear and cycling wear
- technical know-how on how to design and fabricate the knitted fabrics and garments
- scalable technologies on how to finish the fabrics and devices to achieve desirable functional performance
- scientific evaluation and quality control methods on the functional properties of the fabrics or devices
- computer simulations and digital visualisations of their functional performances and
- human physiological and psychological sensory evaluations and illustrations of their functional performances.

The initial phase has already been completed. It covered the complete design and development of winter running wear. Other phases are ongoing and they include the complete design and development of summer running wear, and of cycling wear.

These are all very much about practical applications that can be taken up and run with (no pun intended). For commercial organisations participation can be an attractive option with the Hong Kong government matching each \$1 from industry with \$9 from the ITF.

Professor Li has been responsible for several projects, some ongoing, which include the development of smart thermal functional apparel technologies, concluded in November 2006, with a grant of \$717,000. He has also been involved in the development of innovative nano-apparel technology and applications, completed mid-2004, with a grant of \$502,000, and in a project to examine biofunctional materials and applications, due for completion end December 2010 with a grant of just under \$600,000. This will, perhaps, serve as proof that the Hong Kong government is willing to invest in developments that could have an impact on the entire global sports and activewear industry.

The actual testing is carried out in the Fibre Bioengineering Laboratory at HKPU, which the university has set up with almost \$6.5 million in funding from a variety of government and quasi-government bodies. It is the only fibre



bioengineering research facility of its kind in Hong Kong and is recognised to be one of the leading research laboratories in this field.

Specific fields, in addition to those referred to above, include: biofunctional materials; nano-technology; textile and clothing science and engineering; fibre thermal bioengineering, biomechanical engineering; sensory bio-engineering, and biomedical engineering. There is also computer simulation and modelling; characterisation and evaluation technology and advanced functional CAD technology.

The laboratory has research ties and joint programmes with many universities, research institutions, and companies around the world. The research team has won more than 28 research awards and patents.

Commercial organisations from Hong Kong, overseas and China participate in several of these projects, including Genexy, TAL, SDL-ATLAS, ANTA. This list should continue to grow; Professor Li believes that new high-performance textiles are going to feature more and more prominently in fashions trends. 

Physiological wear trials (top). Body mapping and pattern development (bottom).

 HKPU