

# Engineering Design in Fashioning Technical Textiles



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## Short Communication

Science is a system that comes into existence in the logical relations among facts. Science and technology not only simply bring the facts together but also put forward a theory from these facts. Curiosity is the driving force of this system. That is to say, curiosity triggers learning process originated in testing and observation. This process allows us to build logical relations among the facts, which provides bases for scientific system. Resolving a problem or developing a product in the fields of engineering is directly related to scientific curiosity. This curiosity forces us to critically think about a present product. Critical thinking offers novel perspectives to modify the present product and the modification process makes development of new products probable. Not only successes but also failures are worthy in the process of production because these failures reveal modifiable aspects of the present products [1-5]. Modifying conventional products means to process of creative design. In this respect, creativity is not optional but compulsory in the competitive conditions of today's world. Every fields of engineering must actively use their own scientific knowledge for creativity. Like a muscle, creativity needs to be exercised on a regular basis. Just as one wishes to play cello, piano or guitar well, one needs to practice their instrument regularly. Creative skills can be gained by making scientific activities. Briefly, these activities provide opportunities to create new products to the use of humanity within the framework of engineering design process. From the scientific viewpoint, productions of new product design in technical textiles are developed by modifying diverse aspects of the present conventional products.

Textile has been a significant part of human life since the early age of humankind. Textile products were primarily used for the purpose of protection and covering in the past. Technological advances in the field of textiles have led to the production of technical and smart textiles since the second

half of the 20th century. The interaction between fashion and technology continues to increase through by developments in nanotechnology, materials, electronics, etc. Futurist designers who are creative and pioneering will continue in the direction of fashion interacting with technology, accomplish projects jointly with scientists and engineers working on various technologies and reveal these new technologies upon their fabrics and clothing designs. Interactive products between fashions, design and scientific disciplines are oriented towards smart textiles with high added value. These technical textiles, which will have a huge potential in the future, are expected to constitute a large and important part of the textile industry. They perceive and react to environmental conditions and effects. The interaction between fashion and technology also increases with smart textiles. Their use in the field of fashion products is highly promising in the future and is an area that is open to development.

## Wearable smart textile design

The term "wearable technologies", "fashionable electronics", or "smart garments", is associated to those clothing which are integrated electronic components. Forms and technologies of wearables are mainly divided into two groups: soft/hard supports and soft/hard electronics. "Smart textiles are the results of a disciplinary approach that creates an intersection and overlapping of researches in different fields such as textile, design and technology, chemistry, physics, material science and computer science and technology." The application of smart textiles sees its exploitation in the development of three research areas: conductive materials, miniaturized electronics (sensors) wearable technologies with the use of wireless communication, data transfer facilities such as mobile devices and software [6-7]. In this, the aim of creating and designing an interface between human and computer by integrating information and communication technologies into dress or fabric played a crucial

role. This integration is achieved by impregnating the fabrics with anti-static material, coating the surfaces of the fabric with conductive materials, and spun yarns with conductive materials. One of the major smart textile areas is to monitoring the human body. With such products, it becomes likely possible to monitor

the vital functions such as weight control, body temperature or heart rate in daily life [8]. In addition, detectors like thermo chromatic athlete T-shirts that convert a person's own bio energy into colors and thus demonstrate how often a muscle works during a day (Figure 1).



Figure 1: Monitor Dress Samples [8].

### Optical fiber based fashioning textiles

Optical fibers attract the attention of fabric producers with their light emitting effects. The optical fibers used by

commercially create pleasing and gleaming effects from the fabrics [9]. Fabrics with optical fibers are expected to draw much more attention in the industrial field even though it is difficult to sew them by available technologies (Figure 2).



Figure 2: Optical fiber based textiles.

Smart and technology based textiles, which are attracted considerable attentions because of their functionalities. In time, they have begun to be developed for aesthetical usage and considerations. With a great development in advanced technologies and nanotechnologies have made possible to design very unique structures to use in fashion and garment making. These are now possible due to minimizing mobile devices, power supplies, and electronic devices. Smart textiles are expected to be developed in industrial extend in the upcoming period. Fashion designers are interested in industrial production scale. It has become unavoidable for fashion to be fed from wearable technology and smart textiles. Recently, the concepts of "high-tech fashion" have been put forward. The currently developed

smart structures and technologies used in textile and fashion design are crucial in terms of the today's aesthetic understanding and demands of consumers all over the globe. Many innovative effects that depend on light and color have been used in designs and these modern approaches have given inspiration to designers for futuristic design. Overall; really extraordinary, different and innovative designs are developed in cooperation with scientists, engineers and designers all of whom are experts in their fields. This interdisciplinary approach brings the world of textile, fashion, science and art closer to achieve to benefits each other. The smart textiles that hold qualities like technicality and functionality are beyond the bounds of the creativity of fashion designers.

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