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## Smart Textiles - what for and why?

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Progress in the area of Smart Textiles will to some extent depend on how successful we are in combining theoretical and experimental work in several rather different disciplines; from material sciences, electronics and computer science to textile technology and textile design. It is possible to organize such interdisciplinary research in an efficient and meaningful way by systematically relating specific projects and research issues to the basic questions of what (characterization), how (principles of construction), and why (functionality) with respect to a given type of “smart” behaviour, i.e. dynamic, analytical, adaptive behaviour etc. This is all somehow clear with respect to issues of technology, but what does it mean from the perspective of design? In what way will the introduction of Smart Textiles change the notion of a “textile” product? In what way will the introduction of Smart Textiles change the textile- and fashion design professions?

It is clear that experimental product design can link all the different aspects, which appear in interdisciplinary Smart Textile projects, integrate them and express them through a product, i.e. clothing for extreme working conditions, textiles for technical applications and interior design, medical applications, techno fashion and new types of sports wear etc. (Cf. [Van Langenhove]). Design work in this context will then be situated in the intersection between textile- and fashion design and interaction design. This will also have impact on the products themselves with respect to what they are. There is a need here to focus on the basic questions of what, how and why also from a product and design perspective; what is really a Smart Textiles product? What type of new design methods do we need to develop? What are the basic needs and interests that motivate such products?



### **...introducing the new textile products**

The new Smart Textiles products introduce a shift from passive functionality to active behaviour (Cf. [Berglin1,2], [Jacobs, Worbin], [Landin, Worbin]). This means that the dimension of time will be more important in textile- and fashion design. Form is then no longer only a matter of spatial shape, but it also concerns the temporal structures of interactive behaviour. The basic issue here is how future textile- and fashion design will answer to this call for integration and development and nourish the possibilities that lie in this shift. A successful development implies that the notion of textile materials and technology will change. But along with that basic design aesthetics also have to change; these new products will depend on a partly new type of expressiveness (Cf. [Hallnäs, Redström]).

...transforming the textile- and fashion design professions  
Smart Textiles will transform the craft- and profession of textile- and fashion design. It is a new type of materials that through computational technology makes the material basis of the design process somewhat more abstract; dynamic patterns, reaction behaviours etc that just like music only "exists" in performance, through use, in time. This will change the way we work and it asks for new basic skills and new types of background knowledge. To master the basic means of expression should textile- and fashion designers study programming, mathematics and more of technology in the future? Or are new types of design teams a more natural and reasonable solution? A basic obstacle here is what meaning we then should give to the mastering of our basic means of design expression. It is clear that design by drawing cannot retain its prominent foundational role. The introduction of an explicit time dimension will make the design more abstract and more complex (Cf. Jones discussion about complex design problems in [Jones]). Interaction design will probably be of some importance also in the textile- and fashion design process in the future, which also will imply a change in teaching methods.

### **...making textile- and fashion design part of modern high-tech industrial design**

As we extend the notion of textile materials and technology by developing new materials and techniques and by the integration of for example digital functionality in textile structures textile- and fashion design draws nearer to high-tech industrial design. Does this mean that for example fashion design to some extent also draws nearer to product design? The introduction of new types of functionalities and of an explicit notion of behaviour changes the notion of a textile product and will most certainly also change our behaviour with respect to use, re-use, manufacturing and trade.

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