

SysTex Student Award Submission

A Report About my Work Within Intelligent Textiles

My name is Laura Wilson and I would like to share my unique vision of the future for smart technologies. I am a textiles student who is determined to redefine public opinions on wearable technologies towards a more accessible public availability from the 'concept pieces' seen in galleries, towards more public availability.

I have created prototypes that I would like to share with you, as I am certain they will be most relevant to the SysTex Smart Textile Salon. In this report I would like to explain to you in more depth about my current work, the motives that compel me, and the societal/industrial context I perceive for my designs.

Within my work I strive to reinvent common perspectives of technology and excite the public's imagination with a desirable visual aesthetic. In my opinion a compelling piece of smart –textile, that is to be taken seriously by the consumer, must not only promote its technological benefits, but also possess a caliber of visual design capable of rivaling that possessed by 'traditional' textiles.

My passion for technology integrated textile design was borne from an industry lead project at university, set by WGSN, a global authority in trend prediction.

We were asked to innovatively create fabrics with fall 10/11 in mind. I interpreted the trend '**Useful**' which I paralleled with my own theme of 'change' - as the capacity for change renders something useful in a society perpetually striving for the 'new'. This was also appropriate for fall 10/11 as we may be in or just emerging from a recession. My surface aesthetic took inspiration from 'Growth' and 'Scientific Nature'.

The initial research I did involving trend prediction only encouraged me more to think at a tangent. The appalling waste created to satisfy our trend obsessed culture of 'fast fashion' spurred me towards alternative approaches. I did not want to create designs to feed this unnecessary consumerism. I wanted to create fabrics with the capacity for change, as textiles, or any material with the capacity to change its appearance and properties will have the longevity to defy the aforementioned disposable trends. I wanted to make something capable of adapting with time and climate to meet the needs of different people within society, to develop something that people can invest in and update rather than replace entirely.

I feel there is a gap in the market for fashion that successfully meets the balance between physical appearance and a sustainable relationship with the wearer

It is at this point where I began to employ technology to create these changeable surfaces.

I was inspired by the captivating possibility of using technology to conceal and reveal hidden areas of surface interest, as well as the way this can be facilitated by the natural external conditions that textiles encounter in daily life. Beginning to explore the potential of smart materials and electronics was fascinating, and I wanted to create work that will encourage others to share my interest in wearable technologies.

I incorporated technology with my textile designs to add an element of intelligent change that can adapt to its wearer or environment. I chose crystals as my source inspiration as I liked the contrast between their ancient, gradual formation with the futuristic materials I used.

The aesthetic of my printed fabrics was inspired by mineral crystals as I was interested by the contradictions between their futuristic modern appearance and the reality of their

historically slow and natural formation. I visited a specialist crystal shop to take primary research photographs.

The next step to create the digital prints was to import my photographs into Photoshop editing software. In Photoshop I created my own brushes, combining details from many different images to get the right colours and details, all the time working to life size scale to create a garment with a fully engineered design. This stage took solid days to perfect; contrary to what some may think there was no quick 'cheat' to creating these designs!

I also did a lot of reading within the area of integrating electronics and smart materials within textiles, as I had to plan carefully what materials would be best suited to my project. Many were expensive and difficult to source, and all would be useless if I did not firstly understand how to use them properly.

The 'smart' materials I chose to use within my work included;

- Thermochromatic pigment
- Thermocolour sheet
- UV Photochromatic pigment
- Phosphorescent pigment
- Chameleon nano pigment



- Silverthread conductive filament
- LED lights
- Light Dependant Resistors
- Fibre optics
- Lenticular lenses/3d

Here are examples of my key pieces of work.

This detail, below, is of one of my finished garments, it is digitally printed cotton overlaid with thermo-chromatic pigment and heat bonded thermo-colour film.

I used digital printing techniques as it is a more economically sustainable technique, and it also provided the high resolution imagery required, that I could not have achieved with traditional hand printing techniques.

The body conscious design enhances the form, whilst the surface design transforms in different climates to create a mesmerizing synergy between wearer and environment.

When in a warm environment certain areas of deep purple, blue and midnight black dissipate to expose ghostly pale areas of the crystals glistening texture. I

have been told that to see this first hand it is truly remarkable.

On the frontispiece of the garment I used heat to bond pieces of intricately cut thermo-colour sheeting. At ambient temperature these appear lustrous black, however when worn close to the body these pieces change through the spectrum to a rich blue at warmest.

Another area of my work questioned how we view the work around us, I researched lenticular lenses and 3D imaging to see if I could create prints that would have hidden facets that would be revealed with different lenses.



This successful piece of my work, explored the transition between light and dark using LEDs, fibre optics and photosensitive pigments. The resulting fabric had tactile fibre optic strands emerging through its surface and areas behind the fabric that give a diffused glow. The inks which I printed with interact with the element of light as some hues become transparent in UV light, and others captured energy upon contact with light to glow in the dark.

I wanted this piece to feel natural to handle, so that it would have potential to be really wearable, so I spent much time considering the materials I would use 'behind the scenes' to make this fabric work. To get the functional side of the fabric appropriately discreet I used conductive thread for my circuits, as it has the same lightweight flexible qualities as conventional thread. For switches I used familiar metal clothes fasteners such as zips and press-studs.

I also included tiny light dependent resistors in some of my LED circuits to make them respond to movements around them, as during motion, for example when a hand is passed over the LDR, this can momentarily switch off the circuit or create a colour change within a tri-colour LED.

This piece has inspired me for future work in the areas of soft circuitry. The more I became familiar with the materials the more I appreciate their appearance and would like to expose the functional pieces into a design feature.

For technical improvement the first thing I intend to do is integrate capacitors into my circuits, so that with a solar cell, each fabric could harness its own renewable energy source. This aspect of sustainability is important to the ethos of my work.

Amongst the infinite possibilities for future work I am also particularly interested in utilizing piezoelectronics, as we all walk and move perhaps more than we are in contact with the sun.

At the end of the project my work was featured on the WGSN website, in their gen now section which focuses on upcoming designers and student work.

The support and promotion of wearable technologies by authorities such as yourselves at SysTex is so exciting for me. With your input I am certain that industry will be pushed towards developing smart textiles that are more readily accessible for the high street.

With sponsorship or collaboration from a retail company there is huge potential to developing a commercial range of intelligent garments. I feel that the public want to be introduced to smart textiles in a way that excites, and creates the desire to wear them not only for the novelty, but also because the fabrics are a beautiful and innovative way to support sustainable design for the future.

The initial consumer market for wearable technologies, would perhaps work in the design industry themselves. This is another reason why the fabric or garment must be high quality in order to compete for a share in the market, as this is an industry with notoriously high standards. I have learnt this first hand during a season working for one of Britain's leading fashion designers.

I would hope to see a popularization of collaborations between leading brands with expertise of engineers and scientists. One designer who exemplifies this is Helen Storey, who created her Wonderland series of dissolvable textiles in collaboration with Tony Ryan, the ICI Professor of Physical Chemistry and Director of the Polymer Centre, University of Sheffield

From my awareness of where fashion is currently involving wearable technology I do not feel the two are presently being combined in quite the way I envisage. In brief there are avant-garde designers, such as Hussein Chalayan, and Marios Schwab, who's work is conceptual beyond the realms of wearable. On the other extreme there are garments which technological features render the clothing or fabric so practical that there is no consideration to the visual style. When I have visited the Premier Vision textiles trade salon in Paris, the smart textiles I saw there were aimed at performance for sport or extreme weather conditions, not to entertain, inspire and defy trends as I intend.

I have also explored the SysTex website and was particularly excited by the projects I read about in your informative newsletter.

To summarize I see wearable technologies as the unavoidable next step in sustainable design, and by doing so dispel the associated stereotypes and inspire the public imagination. To raise the profile of wearable technologies can only benefit the industry, and bring with it the revenue required for future research and development.

I would sincerely like to thank you for your time in reading this, and I hope I have expressed my passion for wearable technologies. If you have any questions about my work, or would perhaps like to see more images I will be happy to hear from you. (laurawilson2289@hotmail.com)