

Extreme Fashion: Designers, Artists, and Technologists Present a Glimpse Into the Place Where High Fashion Collides With High Technology

Moderator

Margaret Orth (International Fashion Machines)

Participants

Elise Co (mintymonkey)

Thad E. Starner (Georgia Institute of Technology)

Katherine Moriwaki (Trinity College Dublin)

Jenny Tillotson (Central St. Martins College of Art & Design)

Overview

Incorporating computer graphics, science, and technology into the fashion industry has transformed computer-enhanced garments, textiles, and wearables from fantasy to reality. This session brings together high-end fashion designers, textile producers, a garment manufacturer, artists, and scientists for some fascinating information and a really cool show and

Position Statement: Margaret Orth

As fashion moves towards computing technology, and technology moves towards fashion, at either end of the continuum there is commercial activity. In general, this activity is not a true integration of fashion and technology, so much as the co-opting of the easy to use characteristics of one field by the other. This co-opting between the two fields has created a world where cell phones get fun decorative covers, and jackets get pockets for PDAS.

Lately, consumer computing technology has co-opted so many of fashion's core features that it is becoming all about style—even the software. Electronics are constantly becoming smaller, lighter, more portable, more physically related to the body, more visually expressive, more of the moment, and more disposable. Cell phones and wireless communication are taking over land phones. Young people surround themselves with portable devices, complete with trendy covers. At Radio Shack you can buy printable cell phone covers to change your device's look. (I do love these.) Even the function of these devices is of the moment; they enable the latest form of instant message passing, image passing and game playing. And in year they will be obsolete and you will need a new device, with new functions and new look, or you will be out of style.

But fashion's journey towards computing technology, is unfortunately not so easy or clear. There is certainly a lot of fashion made to accommodate technology, including products with passive pockets to hold technology, and fuzzy or knitted covers to make your cell phone look cool. And bit-by-bit, we are seeing fashion products and soft good products integrate computer and electronic technology in fits and starts. Products like the GAP Hoodio incorporating simple off the shelf consumer electronic devices (like headphones and radio chips). And while we do see a some electronic textiles products emerging, like heated jackets, and soft-switch controllers, these products are still relatively few, and difficult to develop and produce.

The reasons for fashion's slow integration of computing technology in comparison with computing's co-opting of fashion are from my point of view, more practical than creative. The business case for making computing more fashionable is clear. We all want our technology to look and feel better - like anything else in our lives. We all want it to reflect our personal identities. It took the computing industry a while to catch onto this, but now they know. Better looks = bigger market. And it is easier from a business and manufacturing point of view to bring technology towards fashion, then the other way round. It is simply more cost effective to re-develop or re-design the superficial aspects of technology, then to remake computing technology for the fashion industry. The issues that re-making technology face include development cost to number of units, lack of standards, industry know-how, and manufacturing challenges. E-textiles products are emerging, but the industry remains very early industry stage; standards are few, manufacturing paths for textile and technology integration are not straightforward. Applications are still developing and the fashion industry simply has less capital for the process.

I raise all these issues, because they are important to our understanding of what is happening in the middle ground, a space ripe with possibilities and struggles, but occupied for the most part, by a group of maverick researchers and creative practitioners. The researchers presenting at SIGGRAPH ... all occupy this wild and untamed middle space between fashion and technology. This middle space is like an early phase in a biological evolutionary process. Electronic fashion is a practice that is emerging from a new set of environmental conditions and consequently the variety and diversity among early research in this field is huge. Examples in this area include networked clothing, the creative use of scent, and light and mechanical motion as output. Practitioners in this area bring to their research different disciplines and areas of expertise, including art, fashion design, interface design, electronics, electronic textiles, scent, product design, and theoretical practice. And yet, despite these differences in research expertise and intellectual and artistic traditions, there is a mutual desire among these practitioners to create in the integration of fashion and technology something entirely new - that is not just the sum of its parts, but a new area of practice, with new possibilities. We are just beginning to explore all possibilities in this new space, and which of the different forms of electronic fashion will come to be the dominant species, we don't know yet, but the exploration is what is driving us now.

The work of many of these researchers is a strange mix of the fantastic, and the practical and technological; what they create is both a product of their wildest dreams and the limits of real technology. Like hard-core science fiction writers, they create fantastic stories and scenarios and then search for the technology to make them real. Consequently, their work is not just an idea or a conceptual design – it is grounded in the real limits of technology. Like many craftsmen who struggle with the limits of their material as part of their design criteria, these researchers bring the same criteria to their own work. In fact, the same limitations that are keeping fashion from easily moving toward electronic and computing technology are also playing a large role in the creative research being conducted in this middle space. For despite computing technology's incredible advances, it is not yet ready to enable all the fantastic applications that can be imagined for electronic fashion. Consequently, many researchers in this area try to reinvent technology; to make something that will enable their fantasies. Thus the complexity of their task is increased, they imagine, they face technology, they redesign and they reinvent.

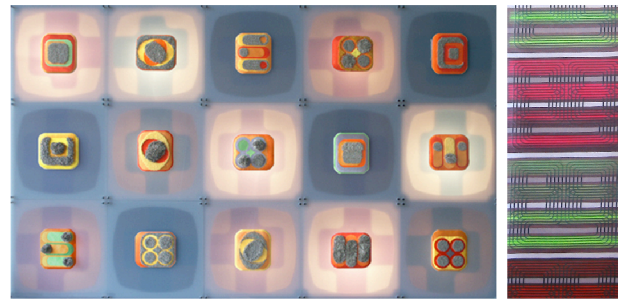
As an artist and technologist, I see my own work as a part of this fantastic middle space between fashion and computing technology, a land of new materials, new aesthetics and hopefully new forms of human expression. At the center of my practice is electronic textiles, but it moves out from there in many directions. My work is sometimes art, sometimes design, sometimes research, sometime worn on the body, sometimes on wall. By necessity it includes design, technology and business strategy.

Artistically, it is the space between material making, the practical and fantasy that I occupy. Electronic textiles present me daily with beautiful, metaphysical aspects of electricity. My passion for them is fetishistic and obsessive. For me, they represent a fantasy of a perverse, other technology that is not hard, fast and noisy, but soft, quiet and intimate. But the idea of them is for me not enough for me. Making them a reality, and the phenomenological experience of these fantastic materials is what drives me. Questions I get to ask daily include: Why is a pom pom a better sensor than embroidery? What is the frequency response of a twill vs. a plain weave? How do I connect to electrically to yarns? What does it mean to add time to a traditionally static medium, like textile design? How does software change the idea of repeat in this tradition? How can I get them to meet safety and product standards? Can I make it fuzzy, conductive and flame proof? Ultimately it is this combination of practical questions, the satisfaction of material making, and the fantasy of world filled with fuzzy electronics that makes my work so satisfying.

Biographic Sketch: Margaret Orth

Margaret Orth is an artist and technologist who creates interactive textile art, fashions, and research at her company and interactive textile studio, International Fashion Machines, Inc. in Seattle, WA. Orth is considered a pioneer in electronic/interactive fashions, wearable computing, electronic textiles and the use of reactive and electronic materials in design and art. Orth has earned a Phd. in Media Arts and Sciences from the Massachusetts Institute of Technology, Media Lab, a BFA from the Rhode Island School of Design, and an MS from the Center for Advanced Visual Studies at MIT. Exhibitions venues include: the Cooper Hewitt Museum,

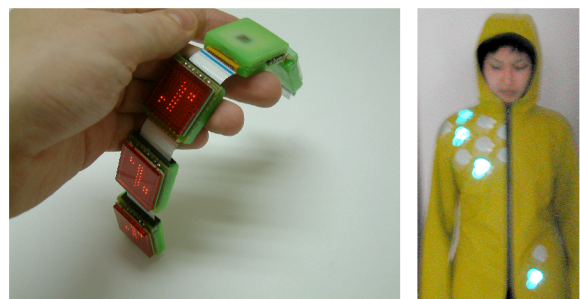
New York, The E-Culture Fair, Amsterdam, Museum of Science, Boston, MA, NTT ICC, InterCommunication Center, Japan, The National Textile Museum, Washington DC, The Stedelijk Museum, Amsterdam, The DeCordeva Museum, MA, SIGGRAPH, and Ars Electronica, Linz, Austria.



Position Statement: Elise Co

Well first I have to thank Maggie for pointing out something I wrote in my Master's thesis from MIT: "I see the true future of extreme fashion as not only the playground for elites who develop and design technologies, but also the everyday consumer-turned-hack-inventor who adopts, appropriates, and ultimately remakes those technologies in their own image."

I think this is still very true. Right now there is a lot of awareness of the field of wearable technology, especially in the realm of new materials and interesting sensors. I am so thankful that pockets for gadgets no longer constitutes "wearable technology." There is a growing community of individuals building their own fashion+technology pieces, as well as progress being made on a larger scale with regards to materials and process research. At the same time, I am still looking and wondering how technology in clothing -- as a visible, expressive element -- is ever going to make it into the realm of real fashion, street fashion. There will always be people with adventurous style who can wear a plastic dress or a jacket with lights, but can electronic fashions reach a wider audience? How? As before, I still think the notion of customizability is key, the ability of technology NOT to be hard-coded, but responsive and reconfigurable. On top of this I would say, above all: design. Behavior with nuance, care in making a light glow instead of blink, beauty in form and details. Clarity in interaction and understandable behavior. Designing every detail means we are designing specific objects and experiences, not just vague prototypes; that's what I'm really excited about.



Biographic Sketch: Elise Co

Elise Co is a multimedia designer and programmer. Her projects include a luminescent raincoat, modular reactive bracelet, and installations for Samsung, Sony, and the Asia Society. She is a

former Professor of New Media at the Hochschule fur Gestaltung und Kunst in Basel, Switzerland, where she taught courses in interaction design and physical computing. Co holds a Master of Science degree in Media Arts and Sciences and a Bachelor of Science in architecture from MIT. At the MIT Media lab, Co explored the synthesis of fashion and technology. Her work has been shown internationally, including at the Museum of Modern Art NY, SIGGRAPH, IMRF Tokyo, Cooper Union, and the New York Art Directors Club.

Position Statement: Thad E. Starner

As a scientist, I believe that sensors embedded in clothing will create a new wave of fashion. This sensewear will range from systems that change their visual appearance based on the user's movements or mood to systems that perform relatively complicated and useful functions. An example is our current work on the Telesign system, which can translate a deaf user's sign language to English. Telesign uses a camera in the user's cap and accelerometers in wristbands for sensing the user's hand motions. A display clipped to the user's eyeglasses allows him to confirm that the system has recognized the sign correctly and to interact with the translation system directly. While our prototype shows a definite lack of visual style, it provides proof that such a system is technically feasible.

Biographic Sketch: Thad E. Starner

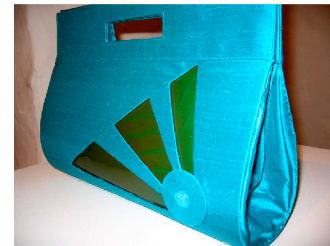
Thad Starner is an Assistant Professor in Georgia Institute of Technology's College of Computing. He is a wearable computing pioneer, advocating the use of a wearable computer as an everyday personal assistant and wearing one as such an assistant since 1993 - arguably the longest such experience known. Starner holds four degrees from MIT, including his PhD from the MIT Media Laboratory in 1999 on "Wearable Computing and Contextual Awareness." Thad has authored over 90 scientific publications on mobile computing, computer vision, and augmented reality and received the best paper award at IEEE VR2000 and the NSF Career Award. His current work focuses on interfaces for augmenting face-to-face conversations.

Position Statement: Katherine Moriwaki

My current research is focused on the permeable boundary between the self and other through technological and computationally embedded garments and accessories. Through the insertion of technological modifiers at the level of the first interface or final layer (as clothing is often referred to in fashion design) I aim to disrupt and alter routines and experiences we collectively share. My dissertation titled "The Social Fashioning of Emerging Communications Infrastructures" examines this through an investigation of identity, starting with the "socio-centric" self and Simmel's notion of space as the product of social relations. The works I have developed take the everyday modes of habituation within the built environment to create changes in the subjective experience of the individual, and by extension groups of individuals. From the advent of my dissertation research I have worked with multiple instantiations of garments, as a more nuanced commentary on how computationally enhanced clothing might function in a mass consumer age. However, first and foremost I am interested in clothing as a material artefact which communicates,

reveals, and illustrates the complexities of contemporary life.

The future of extreme fashion is fraught with thorny twists, some of which seem magical and alluring, yet by other turns bend us awkwardly forward facing an inhuman visage which we hardly recognize as our own. Among the hot gadgets, chic cool-wear, and new materials being developed there will always be a space for artists and designers to develop works which use clothing as not only a means for self-expression, but also social commentary. With fashion, I find myself with the lucky ambivalence of being wedged between high and low technology and culture, operating as a bridge for communication between disparate social groups and ideologies. I see the true future of extreme fashion as not only the playground for elites who develop and design technologies, but also the everyday consumer-turned-hack-inventor who adopts, appropriates, and ultimately remakes those technologies in their own image.



Biographic Sketch: Katherine Moriwaki

Katherine Moriwaki is an artist and researcher investigating clothing and accessories as the active conduit through which people create network relationships in public space. After receiving her Masters degree from the Interactive Telecommunications Program at New York University, Katherine co-developed and taught the ground-breaking collaboration studio "Fashionable Technology" at Parson's School of Design. Currently a Ph.D. Candidate in the Disruptive Design Team of the Networks and Telecommunications Research Group at Trinity College Dublin, her work has appeared in IEEE Spectrum Magazine, and numerous festivals and conferences including numer.02 at Centre Georges Pompidou (02), Break 2.2 (03), Ubicomp (03,04), eulture fair (03), Transmediale (04), CHI (04), ISEA (04), and Ars Electronica (04). She is a 2004 recipient of the Araneum Prize from the Spanish Ministry for Science and Technology and Fundacion ARCO.

Position Statement: Jenny Tillotson

Fashion has a reason; it is a display of personal identity, primarily through strong visual cues. I am a Sensory Designer with a mission to add more sensations into the fashion palette in ways that create radical new fashion properties with real benefit. My

research, the Scentsory Design.E project chooses scent as a tool to improve mental and physical wellbeing, enabling the wearer to act on visual cues or detect scent signals, allowing immediate information.

The project creates “Emotional Fashion: — responsive clothes and accessories that offer social and therapeutic value in a desirable fashion context. The items produce a very personal scent “bubble”: they pulse scent as an atomised mist that is detectable by the wearer alone. Scent is delivered in minute doses focusing on intimate use rather than generalised and therefore higher volume use. This allows targeted delivery to specific parts of the body that is to be more efficient and economic in use. The wearers confidence in their visual identity is thus enhanced by sensory, psychological and medical wellbeing. The basis for this is recent advances in psychology and physiology that demonstrates how scent chemicals have the power to evoke emotions e.g. by modifying electrical brain activity. Also, a new medical approach PsychoNeuroImmunology, studies the connection between emotional stress and physical health.

Emotional fashion creates a scent symphony that changes with emotion, delivering benefit chemicals in controlled ways responding to personal needs. The “symphony” allows for a new concept in perfumery - not just top notes fading away, but the ability to pick from the entire palette of scents changing over time. The properties should be good for all, but they will be of specific value to people susceptible to anxiety and depression. This is a significant benefit; according to the World Health Organisation who predicts that in 2020 depression will be the illness of the age, second only to heart disease. It reduces the need for traditional antidepressant routes to treatment, and thus a range of unpleasant side effects from these drugs such as headaches, insomnia, agitation, excessive sweating etc. The Scentsory Design(((TM))) project focuses on the “new data senses.” Prehistoric people relied greatly on what we under use, cognition of the imperceptible changes in smell, touch, color and light that kept them alive. Their sensory appreciation taught where there was danger, what foods to avoid, when women ovulated and when it was time to sow and reap. Animals still rely on personally discriminating those changes. We humans have not lost those facilities, but we have grown to rely on data presented in another way. Scentsory Design(((TM))) shows that the re-invention of these facilities is possible through biotechnology.

In the future Extreme Fashion will include clothes that act as a detection platform — they will sniff our body state through embedded electronic nose sensors in garments that diagnose lung cancer, heart disease and diabetes, or pinpoint when a woman is ovulating - or detect the body odour of a criminal by storing valuable smell data in the fabric. Further applications include clothes that emit scents to communicate the time or assist the sensory impaired who cannot see or hear. Clothes can also enrich our experience of life and human interaction between one another. They could detect someone whose pheromone profile is of interest to us by sending a sample of our own pheromones - so love is literally in the air.



Biographic Sketch: Jenny Tillotson

Jenny Tillotson is a Scentsory Designer and Senior Research Fellow in Fashion & Textiles Design at the Innovation Centre at Central Saint Martins College of Art & Design (CSM) and a Fellow of the Institute of Nanotechnology. Dr Tillotson gained her BA in Fashion Communication at CSM in 1991 and a PhD at the Royal College of Art in 1997. Her research straddles the science/art boundaries, bringing together the disciplines of Analytical Chemistry, Nanotechnology, Perfumery, Engineering, Fashion/Textiles and Sensory Design.

Dr Tillotson designs with scent, working with computerised scent-output systems worn on the body for health and wellbeing applications. Prior to her academic work she was a stylist in the fashion industry. Her scientific partners include Professor Andreas Manz from the Institute of Analytical Sciences in Germany and Professor Ghassan Jabbour from the Flexible Display Center at Arizona State University. Her work has been widely exhibited at the NEMO Science Centre, e-Culture Fair, Cheltenham Festival of Science, FEED festival, Royal Society, Tate Modern, Banff New Media Institute, WIRED NextFest 2004, SIGGRAPH 04 and Ubiconf 2004. Forthcoming events in 2005 include the Victoria & Albert Museum and Avantex Smart Textile Symposium.