



YOU LIGHT UP MY LIFE: Hacking the Senses with Wearables

By Craig Crawford

DOI: 10.14504/ar.16.4.1

The Zac Posen illuminated fairy princess dress worn by Claire Danes to this year's Met Costume Institute Gala was a media sensation. Constructed with LED fiber optics, the sky blue ball gown was so large, the actress had to arrive in a private hire bus.

PHOTO COURTESY OF CUTECIRCUIT, PHOTOGRAPHY BY THEODOROS CHILIAPAS
THE EIZA DRESS PINK AND BLACK HAUTE COUTURE

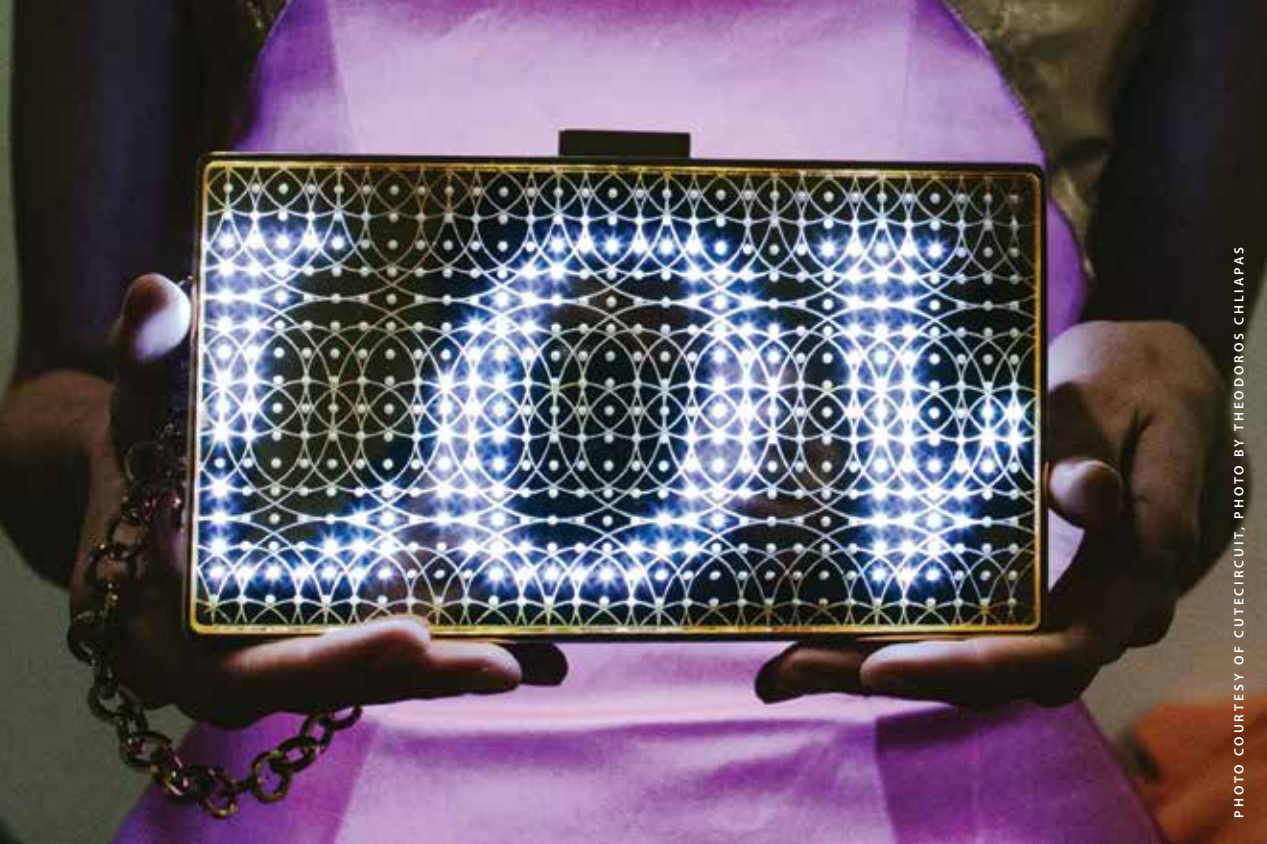


PHOTO COURTESY OF CUTECIRCUIT, PHOTO BY THEODOROS CHLIAPAS



CuteCircuit Mirror handbag.

It's About Pizzazz

Danes wasn't the only one who couldn't sit in her wearable tech created for the "Manus x Machina: Fashion in an Age of Technology" exhibit-themed New York City gala.

Supermodel Karolina Kurkova also stood in bus transport to keep from damaging her interactive cognitive illuminated gown. Taking its hue from the sentiment of real time tweets, the dress was designed by Marchesa in collaboration with IBM's Watson computer. Materials used to make the dress as well as colors to represent the emotions the designers Georgina Chapman and Keren Craig wished to convey were all Watson-suggested. Watson then provided real time analysis of twitter sentiment and triggered colors to change on the dress accordingly.

Earlier this year in London, artist and designer Professor Helen Storey of the London College of Fashion revealed an illuminated gown aimed at creating social awareness. "Dress for Our Time" is sewn from a discarded tent donated by the United Nations High Commissioner for Refugees (UNHCR) and is a collaboration with the London-based interactive creative agency, Holition, the London Met Office, and Unilever. The gown has been engineered to change color and illumination pattern as data is received. The first showing of the dress displayed data from the impact of climate change due to global warming. The next planned data set will display the migra-

tion of refugees globally. As more refugees leave their homelands, the illumination will move up the dress.

CuteCircuit, a London-based wearable technology and interactive fashion house, has been creating illuminated and interactive apparel for more than 10 years. Katy Perry wore one of their illuminated gowns to the Met Gala in 2010. And for the 2013 UK launch of the EE mobile phone network, CuteCircuit created a black chiffon evening gown with interactive illuminated panels that displayed live fan tweets during recording artist Nicole Scherzinger's performance. The dress appeared to be a living LED tickertape of real time tweets.

The company's new Twinkle line (combining the words "Twinkle" and "Sparkle") allows wearers to change the patterns on their clothes via an app. When the technology is off, the garments glitter from reflective crystals. But when the technology is turned on, a garment can move from a print, to a stripe, to a plaid. And the amount of twinkle depends on how much the wearer is moving. These garments don't require the user to stand, are comfortable, and, in addition, they are washable.

It's About Self-Expression

The Internet of Things, mobile technology, and big data are now allowing new collaborations and connectivity in ways previously not possible.

"The next phase is about social connection and communication," explained CuteCircuit Chief Creative



PHOTO COURTESY OF SKINTERFACE

Skinterface in milan glove demo .



PHOTO COURTESY OF SKINTERFACE

Skinterface rendering of pattern.

Director and Co-Founder, Francesca Rosella. “It’s about expressing yourself through technology.”

Seattle-based Gemio has created a friendship bracelet that changes color, recognizes secret handshakes, and was built to facilitate human interactions. Panels on the bracelet are interchangeable and controlled via the MyGemio app that allows wearers to design light effects, change colors on demand, and send light messages to each other. The founders aim to bring friends together to celebrate relationships wherever they might be located.

It’s About Sensation

CuteCircuit’s now iconic Hug Shirt, created in 2006, was one of the first wearable tech garments to simulate touch. The shirt allows wearers to transfer the sensation of a hug using sensors embedded in the garment, Bluetooth tech, and an app. Hugging is as simple as texting.

And for the more erotically inclined, there is Fundawear, underwear that contains stimulating sensors that can be controlled by your partner’s phone app. The male and female undergarments were designed for a Durex Ad Campaign by the Australian We:eX (Wearables Experiment), a socially-driven wearable technology company that aims to bring together fashion and technology with a functional design aesthetic to help us live well and have a better quality of life.

At this year’s Super Bowl, We:eX debuted the Fan Jersey (USA), a football jersey that uses haptic vibrations

to bring the fan onto the field whenever a big play happens in the game. Using intimate sensory technology, these Fan Jerseys translate the action of the game directly and instantly onto the viewer.

“As a leading innovator in wearable technology, we were thrilled to unveil these Fan Jerseys to help promote and enjoy the biggest sporting event of the year,” said Billie Whitehouse, cofounder of We:eX. “There’s no better place to demonstrate the power of more deeply connecting fans to their favorite sports moments. By using the skin as an interface, our Fan Jerseys allow the excitement of the game to literally be felt in ways never felt before.”

Launched at this year’s Milan Design Week, Skinterface asked the question, “Can we hack sensations?”

As sensory architects, George Wright, Ka Hei Suen, Charlotte Furet, and Andre McQueen from London’s Royal College of Arts and The Imperial College are expanding augmented reality currently limited to sight and sound sensory perception.

Their garments are covered with individually addressable actuators that form a matrix that covers the body and interacts with the wearer’s skin. Each magnetic mode can move independently and change temperature.

Consider what it feels like to be gradually immersed into warm water. With Skinterface, you can feel it without actually doing it.



PHOTO COURTESY OF CATAPULT

Catapult training on the field.

But what if you can't feel? That's exactly the problem that Royal College of Art and Imperial College London Design Innovation graduate students Lucy Jung, Daniel Garrett, Ming Kong, and Elena Dieckmann set out to solve when creating Bruise, an injury detection suit for disabled athletes who have loss of sensation.

Made from a sweat-wicking stretch fabric that contains recyclable pressure-sensitive film placed in high risk areas, the garment changes color if an area is stressed, indicating injury. After training or competition, injured areas are easily seen and treated.

London-based Infi-Text creates patented pressure sensitive materials that enable switches and sensors to be "printed" onto textiles. Washable, these sensors have been used by NASA in astronaut gloves, as well as the soon-to-be-launched SmartMat Yoga mat that helps you improve your practice via an app that interprets your pressure as applied to the mat during your session.

And if the mat isn't enough to sort out your Yoga, We:eX's Nadi—a line of tights that contain vibrating sensors to help correct your positions—should do the trick!

It's About Action

So are Fitbits a thing of the past? Not according to Addidas. With miCoach, Addidas is bringing to the

consumer level what professional athletes have had for some time: integrated sophisticated fitness monitoring ecosystems that combine apps with sensors to coach for optimum performance.

miCoach has training programs for runners, soccer, basketball and tennis, bringing to the masses what Catapult did for the major leagues.

Both systems use removable devices worn by athletes. These then transmit data back to an app that offers performance analysis in a number of ways.

The Catapult device is about the size of a pager and is held in place between a pro player's shoulders with what resembles a sports bra. The sensor tracks acceleration, deceleration, distance and speed via a global navigation satellite system. A 3D accelerometer measures stops and starts, while a 3D magnetometer monitors direction and a 3D gyroscope measures how much the body twists and turns. Used by the NBA, AFL, NFL, and NRL this is some serious exclusive professional sports technology that allows coaches to know what an athlete is capable of and how to coach them for optimal sports performance without over-training.

Using the same premise, miCoach lets you choose from a variety of sports and coaching options, putting you in control of what you do and don't do with exercise. This includes social sharing with friends.

Yes, they *both* meet the new version of ISO 105-B02.

- Full range of optical filters for all major standards including ISO 105-B02, ISO 105-B04, AATCC TM16, TM111, TM169, etc.
- Air-cooled for low operating costs and less maintenance
- Affordable, accurate and remarkably easy to operate
- Rotating drum and flat-array designs available
- Amazingly simple calibration

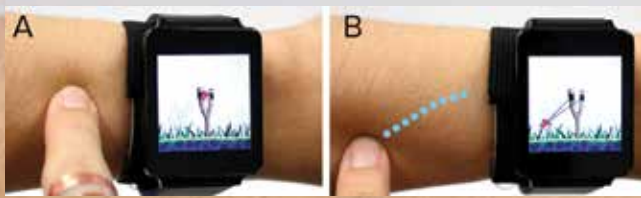


Q-SUN

Xe-2 and Xe-3 xenon arc test chambers

www.q-lab.com/AATCC





PHOTOS COURTESY OF CARNEGIE MELLON

Skin track map apps.

Ralph Lauren offers sportswear that has sensors woven into the garment. Powered by OMSignal, these sensors transmit data to an app that allows you to monitor your athletic prowess.

Later this year OMSignal will be releasing their OMbra—a woman’s sports bra with integrated sensors that also integrate to a fitness app.

It’s About Time

With the first year anniversary of the Apple Watch upon us, what’s progressed in the smart watch sector?

The DZ09, just out from China, enters the market at under US\$50 (in some places under US\$25) making the once luxury item affordable for everyone. While the watch can connect to a smartphone via Bluetooth, it has its own micro SIM allowing it to also operate independently.

The London-based team at Vector were watchmakers first, technologists second, and so their smart watches are created as timepieces with technology (not the other way around). Waterproof to 50 feet, the screen is only black and white, and the face is larger than most smart watches on the market. Larger screen size and no color allows for a battery that only needs to be charged once a month. Battery life is a big challenge with most smartphones and wearable technology.

“As we continue to develop features and functions, we create what our community wants and votes for,” explained Vector Senior Brand Marketing Manager, Elisabeth Rollin. She says that the next release will allow you to operate your smartphone camera remotely, basically turning the watch (which works on Android and iOS platforms) into a selfie stick.

But even with larger screens on the market (there is even a two-screen watch prototype known as Doppio created by Dartmouth College researchers), researchers at Carnegie Mellon think we should be able to use our arms as well to interact with our smart watches.

By creating a watchband with sensors and a ring with additional sensors this proof of concept prototype allows wearers to draw, swipe, and dial from their arm. The modern day version of writing something on your hand to remember it!

It’s About Enjoying the Moment

“Sometimes we just need to put down the phone and enjoy the moment,” said Christina D’Avignon, CEO of Ringly, a New York-based wearables company that designs jewelry that happens to be high tech.

A ring with sensors that vibrates when the phone rings allows a woman to keep her phone in her handbag and not miss a call.



PHOTOS COURTESY OF VINAYA

Altruis ring and app.

The launch of their new Aries bracelet collection rounds out the jewelry offering, and a new fitness app makes this bracelet a pretty alternative to a sporty plastic Fitbit.

London-based Vinaya is a research and design house aiming to explore the relationship between humans and technology. CEO and Founder Kate Unsworth has launched Altruis, a high-tech jewelry collection—from a slightly different perspective

“I am a techie at heart and I realized at one point I was addicted to the screen,” she said. “I would secretly text under tables and couldn’t control my addiction.”

After quitting tech cold-turkey, Unsworth realized she had been substituting tech interaction whenever she was stressed by real human interaction.

“I was hiding behind the screen, and I thought, I can’t be the only one,” she said.

While the jewelry is pretty, it’s the app that is the real differentiator.

“I wanted an app that made you feel comfortable about technology and would help with the overload while still allowing you to remain in touch with important notifications, calls, and social media alerts,” she explained

The app allows the wearer to organize a diverse selection of smartphone activities, freeing her up to remain “present.”

“We live in a connected world and I love being connected, but I needed something that gave me the power of being in control. This allows me to be present, to engage in real life, to be creative instead of being distracted or actioning someone else’s to-do list from email,” she said.

“As tech designers, I think it is our responsibility to design tech in a way that it is less invasive. This doesn’t mean less tech, it means different user interfaces. The screen isn’t the only user interface.”

