“Smart” Artifacts

By Vsevolod (Seva) Ivanov

CART 412

MIT BioSuit

As for where the coils may be threaded within a spacesuit, Holschuh is contemplating several designs. For instance, an array of coils may be incorporated into the center of a suit, with each coil attached to a thread that radiates to the suit's extremities. As the coils activate, they could pull on the attached threads — much like the strings of a puppet — to tighten and pressurize the suit. Or, smaller arrays of coils could be placed in strategic locations within a spacesuit to produce localized tension and pressure, depending on where they are needed to maintain full body compression.

http://news.mit.edu/2014/second-skin-spacesuits-0918

https://youtu.be/FbazOdEQxuE

TouchMan

Conductive gloves with stainless steel fibers - The "TouchMan" is made of stretchy material and is characterized by the best wearing comfort with the highest performance. Conductive yarn is knitted or woven into the fingertips of the glove. Our unique and simple design allows the user to use devices with touchscreen accurately and precisely without having to remove the glove. The gloves are washable and do not oxidize, making them a completely safe product for the skin and electronic devices.

Conductive fingertips, No oxidation, Machine washable,

Durable conductivity, High precision, Skin-friendly

http://de.aiqsmartclothing.com/

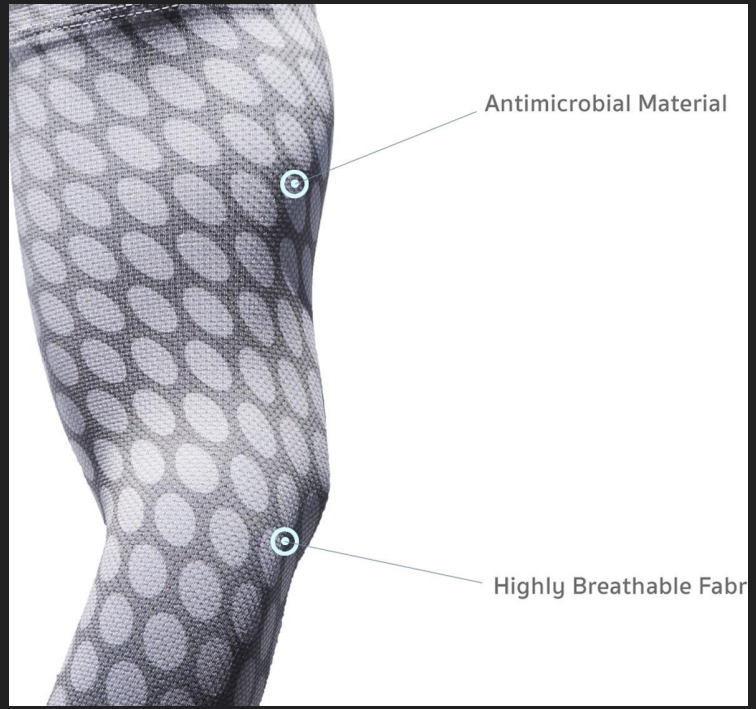
Second Skin

Human skin naturally sweats to get rid of the excessive heat and cool down the whole body, however, traditional clothes prevent this process from happening" says Lining Yao, a PhD candidate who worked on the design with a team of researchers. "In bioLogic, our 'Second Skin' reacts to sweat and facilitates this physiological process.

In the lab, the researchers had accidentally discovered that Bacillus subtilus—a bacteria best known as an ingredient in the Japanese fermented food natto—naturally transforms, swelling and shrinking depending on humidity.

https://www.fastcoexist.com/3052801/this-shape-shifting-clothing-is-alive-and-powered-by-bacteria

AIO Sleeve



AIO Smart Sleeve Combines benefits of compression sleeve and activity monitoring including full time ECG and blood oximeter.

There's a nano trace built into the sleeve. It's a conductive material that's in a liquid form that connects one electrode to the other. That's how we can utilise the ECG from the point of the wrist to under the arm inside the bicep. The points need to be far away enough to measure the heart contractions. That was our number one challenge.

The AIO Smart Sleeve is designed with two different fabrics. The first uses a polyester Lycra blend, the standard material used for compression sleeves, and the second uses thin, breathable, antimicrobial polycarbon material. The AIO Smart Sleeve not only fits snugly and improves your daily reporting, but also provides a more comfortable alternative to today’s activity bands.

http://techaeris.com/2016/04/07/worlds-first-activity-monitoring-compression-sleeve-hits-kickstarter/

Heated clothes

Our electronically heated clothing keeps you warm - even without huge heating surfaces, which interfere with their weight in your outdoor or water activities. Our unique, coated stainless steel yarn is integrated into a special fabric to guarantee your safety and comfort. The ThermoMan is hardwearing, machine washable, soft and lightweight. The heating pad does not have to be removed before washing.

Lightweight, Machine washable, Fast warming

Uniformly distributed heat, Durability

http://de.aiqsmartclothing.com/

Solar-Powered Fashion

The designer Pauline van Dongen made a Wearable Solar project that shows how solar cells can be integrated into fashion, repurposing clothes as alternative energy sources. Pauline speaks about how the line could evolve through factors like better battery life and washability, as well as its potential impact on the future of woven textiles and fabrics.

https://www.youtube.com/watch?v=rhUqDy4tg50

photovoltaic fabrics

https://youtu.be/m44EgocbkOc

https://www.youtube.com/watch?v=6KsvTJ5zIUU

Anti-radiation protection

Anti-radiation protection with the ShieldMan achieves a completely new dimension. With the EZ-Safer fabric from King's Metal Fiber Technologies, Cloth, which protects against electromagnetic radiation and consists of a fine metal fabric, is uniformly incorporated into the ShieldMan products. This allows us to provide complete protection without compromising wearing comfort or the fashionable style.

Unique shielding, Excellent fabric quality

Machine washable, Soft material

Lightweight, Skin-friendly, Antistatic

http://de.aiqsmartclothing.com/

Touch Me

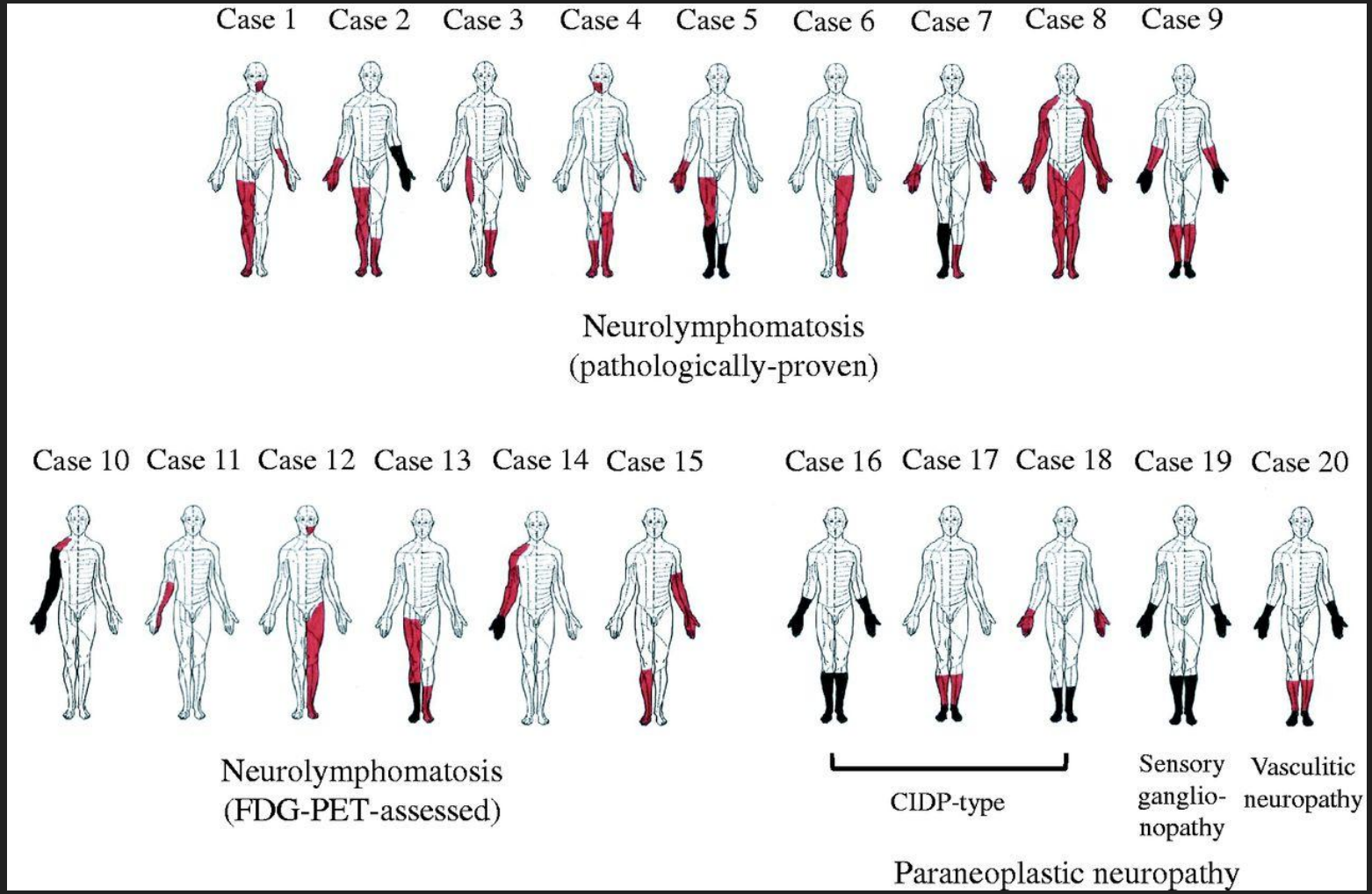
Chromogenic systems change colour in response to electrical, optical or thermal changes. These include electrochromic materials, which change their colour or opacity on the application of a voltage (e.g., liquid crystal displays), thermochromic materials change in colour depending on their temperature, and photochromic materials, which change colour in response to light—for example, light sensitive sunglasses that darken when exposed to bright sunlight

https://www.youtube.com/watch?v=zyTtfj-40tU

Superhydrophobic coating

https://www.youtube.com/watch?v=BvTkefJHfC0

Speculative Design


Case 1
Case 2
Case 3
Case 4
Case 5
Case 6
Case 7
Case 8
Case 9
Neurolymphomatosis
(pathologically-proven)
Case 10
Case 11
Case 12
Case 13
Case 14
Case 15
Neurolymphomatosis
(FDG-PET-assessed)
Case 16
Case 17
Case 18
Case 19
Case 20
CIDP-type
Sensory ganglio-nopathy
Vasculitic neuropathy
Paraneoplastic neuropathy

Mononeuropathy

=

Damage to a single nerve

The Ulnar Nerve

- Muscles innervated
  - Flexor carpi ulnaris, flexor digitorum profundus, adductor pollicis, small digital muscles
- Motor functions
  - Finger adduction and abduction other than thumb; thumb adduction, flexion of digits 4 & 5; wrist flexion and adduction
- Sensory
  - Skin over medial surface of the hand through the superficial branch

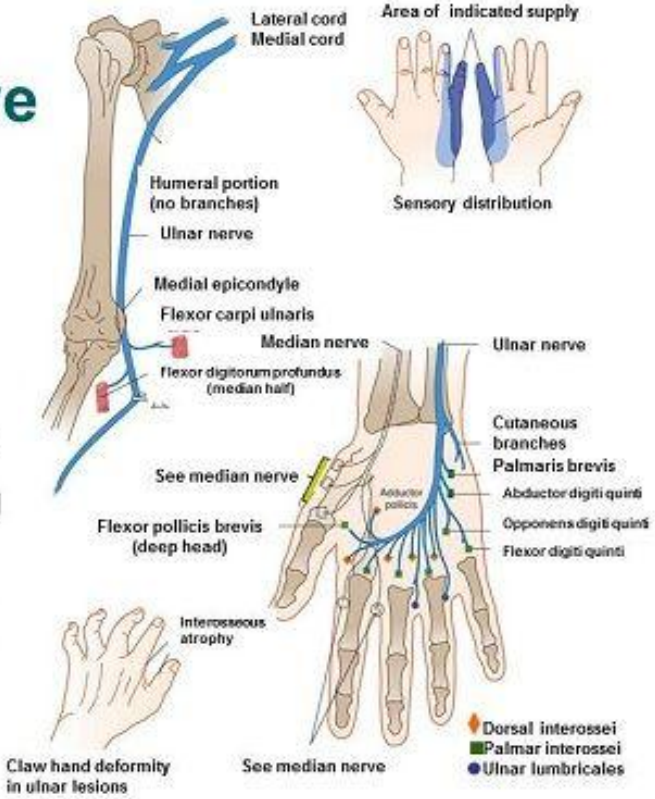


Figure 28-9 . The ulnar nerve (C8, T1).In: Waxman SG. *Clinical Neuroanatomy*, 26th ed. http://www.accessphysiotherapy.com. Accessed May 10, 2011.

Electronic Textiles

Wearable technologies promise to transform the fashioned body forever. As technologized textiles redefine garments as mobile, networked environments, they anchor the cerebral world of intelligence to the intimate environments of the modern human. The exchanges between them are facilitated by fabrics woven from fibres capable of conducting electrical impulses and transferring information. Known as electronic textiles, the new generation of fabrics are fibrous substrates into which microelectronic components and connectors have been seamlessly integrated. As technical hardware and tactile textures become one, the fabrics that result are free from the bulky external components that make earlier generations awkward to wear.

Like computing devices, electronic textiles can relay information via conductors, switches and sensors and exchange signals with remote systems via transistors and woven antennae. Threads coated with metals such as silver and nickel make excellent

Textile Futures by Bradley Quinn

Bioamplifier clothes

http://www.metamotion.com/images/cyberglove.jpg

The purpose is to use the Electroactive Polymer clothing to actuate motions in areas having motion handicaps. At first, we harvest nervous impulses using the 1-channel recording electrode. Then, we amply this signals using small embedded amplifiers. In turn, they will generate an electrical charge which will make the Electroactive Polymer to change its shape to help the motion in question. The latter creates a bioamplifier clothes.

This idea combines the Greg Gage's SpikerBox and the Electroactive Polymer material.

Neuron SpikerBox https://www.ted.com/speakers/greg_gage

Electroactive Polymer https://www.youtube.com/watch?v=BgaxscXsIWY