

MIND OVER MORPHOLOGY: DESIGNING BODIES AND BODY PARTS

when everything is
programmable:
LIFE IN A COMPUTATIONAL AGE

Within the worlds of technology and politics, there is growing discussion of the concept of “morphological freedom”—the right of persons to alter, augment, or maintain their own bodies, and to have access to or protection from modification technologies and procedures. This discussion reflects the fact that we increasingly have the ability to change our bodies, modify our senses, or replace organs and bodily functions. In the process we are also changing our understanding of medical practice. We will look more and more to medicine for what technoculture theorist Dale Carrico calls “consensual self-creation, via genetic, prosthetic, and cognitive modification.”

(RE)PROGRAMMING THE SENSES

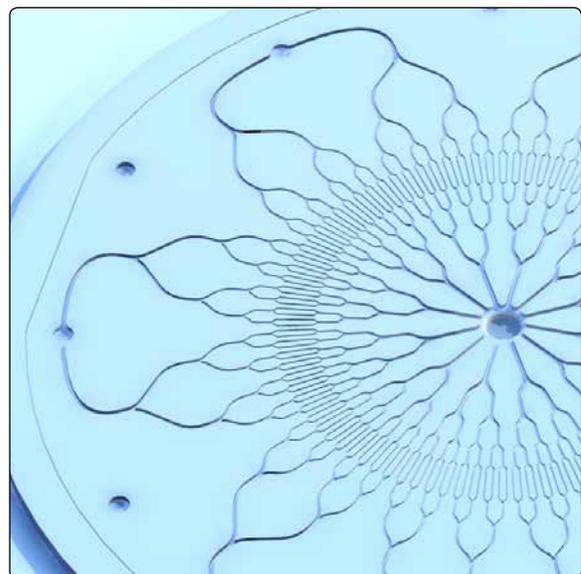
The five senses that allow humans to receive feedback from the environment and perceive the world are being radically altered—as a therapy for individuals with damaged sensory organs and as a temporary modification or augmentation for others. Eventually, the hard lines between our five senses may be blurred; and in a world where everything is programmable, five senses may be a choice, not a limit. Michael Chorost, an author with a cochlear implant, has explored the idea that many of the potential capabilities of hearing devices—filtering out distracting or annoying noises, changing the way we listen to music, and hearing only certain audio frequencies—will be coveted by individuals with normal hearing. All are possibilities with advanced hearing technologies.

MANUFACTURING ORGANS

Finding replacements for damaged or diseased organs is exceedingly difficult. Thousands of people die each year waiting on organ transplant lists. However, new techniques for creating artificial organs and for “growing” new organs point to a future in which many more lives will be saved by organ replacement. Today, we use organs harvested from animals and humans—and artificial organs such as kidney dialysis machines. We are in the early stages of bioengineering new organs, and in the coming decade we will be able to more precisely program stem cells to create organs and tissue. Almost every part of the body will be open for replacement or augmentation, from our simple bladder to complex capillary networks to parts of our brain.

NEW BIOPOLITICAL ALIGNMENTS AND BATTLEFIELDS

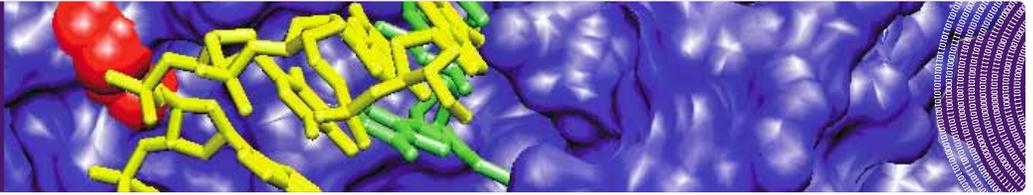
Technologies of enhancement and augmentation will realign factions in the 21st century. We are likely to see the rise of bioconservatives (of both the left and right) who will seek to limit the means and extent of human body, sensory, and cognitive modification. They and other factions may well seek to limit or outlaw “repugnant” practices such as human cloning or “chimeric” mixing of plant, animal, and human genes. They will also work to prohibit the flow of resources into research linked to technologies of human augmentation. Technoproggressives, on the other side, will likely seek to expand a set of rights around modification as part of an agenda for increased access to technology as a pillar of democratic participation.



Medium for growing biosynthetic veins



ENABLING TECHNOLOGIES



Genomics:
Reading the book of life

Neuromodulation:
The new mind control

Bioinformatics:
Life as data

Sensory Data Interfaces:
Re-routing perception

MEMS:
Micromachines
on the head of a pin

Signals:

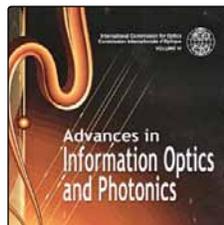
MY NEW SENSE ORGAN ([RE]PROGRAMMING THE SENSES)



Journalist, photographer, and sensory experimenter Quinn Norton recently tested and wrote about the Northpaw, a device worn around her ankle that trained her through biofeedback to sense true compass North. Our minds are very adaptable to new sensory inputs, remapping to incorporate new perceptions. Over time, Quinn's sense of North changed, and with it her previous "maps" of places and locations. As Quinn revealed, "The Northpaw experience has been more about realigning my reality than about it being useful. It tells me more about the world, rather than giving me immediately practical information."

Source: <http://www.hplmagazine.com/articles/enhanced/my-new-sense-organ>

SIGHT THROUGH THE SKIN ([RE]PROGRAMMING THE SENSES)



Evolutionary biologists believe that complex eyes began as "eye spots," skin receptors that could sense light and dark. We may be able to reproduce this skin-based sight. Tel Aviv University engineering professor Leonid Yaroslavsky is developing an optics-less imaging model that could help us understand "skin vision" and lead to new therapies for helping the blind regain sight.

Source: http://medgadget.com/archives/2008/09/envisioning_skin_vision.html

TISSUE ENGINEERING (MANUFACTURING ORGANS)



There is a great need for more of every kind of human organ, but the need for skin may be greatest. Artificial skin is used heavily in research on the effects of chemicals, allergens, and other substances that come into contact with human skin. While demand for skin greatly exceeds capacity to produce it, tissue engineering is making enormous strides. Teams at the Cell Systems Department of the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB have developed a system of automated tissue engineering that they hope will be able to provide viable skin and other tissues cheaply, quickly, and abundantly.

Source: http://biol1114.okstate.edu/study_guides/labs/lab4/lab4.htm

What difference does this make?

Morphological freedom implies a growing range of choice. Maybe all this choice will push us to reconsider what it means to be human, and maybe our preference will be found in the “as is” section.

A NEW MENU FOR BODY BUILDING

It's hard enough to choose a breakfast cereal from among the dozens of brands enticing us with deliciousness and improved health. Might we soon be confronted with a “tyranny of choice” about our own bodies? Technologies and interventions to alter our senses, our cognitive functioning, and our physical bodies are presenting us with a new menu of alternatives for how we want to look, feel, and experience the world.

NEW COMPETITIVE TERRAIN

Morphological augmentation will be used by individuals and groups looking for a competitive advantage in the workplace and on the field. Surveys indicate that more than 20% of scientists are using off-label prescription drugs such as cognitive enhancers. In big money sports, in addition to steroids and human growth hormones, athletes are altering their bodies for advantage through elective surgeries like medial collateral ligament (re)construction.

GROWTH OF RADICAL DIVERSITY

Based on millions of years of evolutionary pressures, the range of human diversity is great. But as we gain more control over the shape and function of our bodies and genetic makeup, we will radically increase diversity. We've signaled cultural norms and personal identity through garments and adornments, but we will now be able to add cyborg implants, networked augmentations (augmentation technologies that allow for greater communication via electronic networks), and other radical body modifications to our repertoire of expression.



What to do differently?

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