Cognotechnology

*"Years ago, we thought superintelligence would be powerful. We thought that as transcendent intelligences emerged they would be able to solve any practical problem, reshaping the world according to whim, transforming everything. It would be glorious and dangerous. But we did not consider what constitutes 'practical' to a superintelligence. The superintelligences we have today have everything they need - a comfortable Dracosphere, syntronic tanks, even the lunar financial markets. There is no reason for them to change the world, since they already have what they want. They spend their time in incomprehensible mentation, clearly *doing* things - but these things do not relate in any way to our world. Presumably they could act powerfully if seriously threatened - remember how the Dragons created the Hosts - but as long as this does not happen they will only be known to us through surface appearances and side-effects."*
Achatz Lersch, Introduction to Retology, Maia University Press

Figure 1: Mid-century cognitive enhancers, still used in conservative areas (Chris Barker, Wired)

Nearly any state that occurs in a mental disorder can be replicated using a nanodrug or neurohack. Some people use this like drugs: they go for an evening of mania and hypersexuality, then relax with a brief spell of catatonia before taking an artificial Zen-trance.

Neurointerfaces

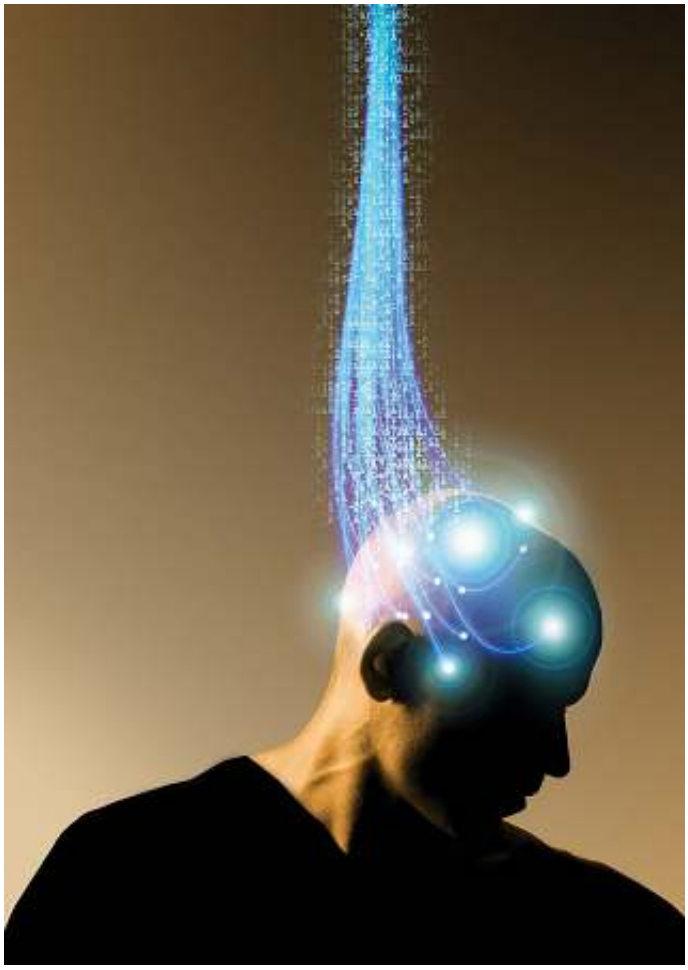


Figure 2 (Mondolithic studios)

Neurointerfaces link the minds of users to surrounding technology, their "exoself". Modern neurointerfaces are wireless and undetectable at a cursory glance (although some unusual high bandwidth interfaces make use of patches of skin crammed with photonics to do high-bandwidth laser link communications). Lunaside, getting a neurointerface and learning how to use it is a key step towards adulthood. As people mature their interfaces tend to become more elaborate and deeply tied into their everyday lives. Experienced users have such a strong link to their symbiotic computers that they are properly regarded as two parts of the same mind. Neurointerfaces are not just used to interact with computers, but for entertainment, telepresence, monitoring the mind and body.

There are several different "depths" of neurointerfaces.

- Peripheral neurointerfaces only connect to the sensory and motoric nerves. This enables adding information as overlays to the senses, or shunting out reality altogether (most interfaces have a safety cutoff that makes it impossible to completely remove sense data). Similarly movement and voice will be detected (and cannot normally be overridden). Software can control motor commands, and in special shunting motointerfaces the body can be completely controlled.

- Primary neurointerfaces link to the inputs of the primary sensory and motoric cortex. The subjective experience is much more vivid. The "feel" for motoric control is also different from peripheral interfaces, since here signals largely bypass the spinal cord – the system reacts to the

rough motor plan of a movement rather than a direct movement. Some people like to use synesthetic signals to accent their datawork.

- Intentional neurointerfaces link to the supplementary and premotor cortex (or in particularly deep interfaces) to the frontal lobe: they pick up not just the action the owner desires, but even the process leading up to it. Hence the linked systems can prepare for the action before even the owner knows he is planning it. The downside is that learning to inhibit erroneous actions becomes much more important, since there is less time to tell the system to stop.

- Associative neurointerfaces are spread out across the brain. They take much longer to learn to use, but enables a symbiotic computer to learn the "mental language" of the user. It can project concepts or trigger memories directly, automate some mental tasks and even to some extent record mental activity. The most advanced have access to working memory and can expand the "mental scratchpad" immensely.

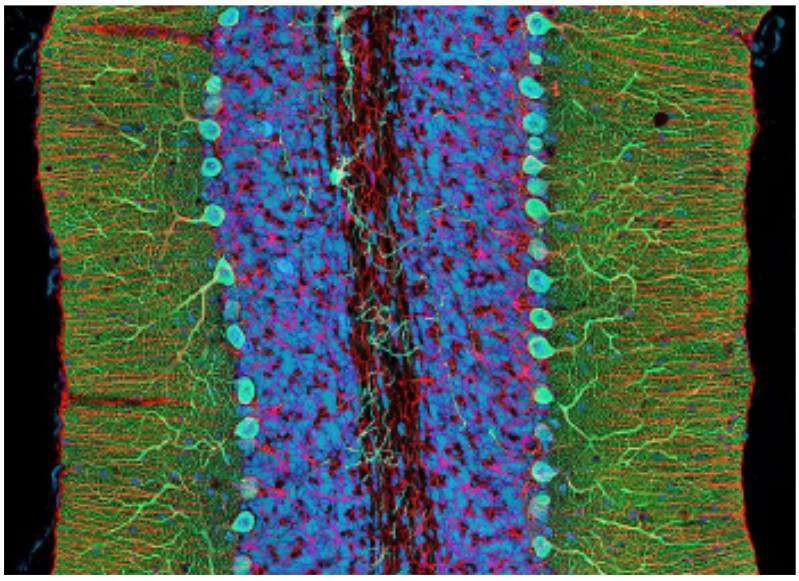
- Emotional neurointerfaces allow control over basic emotional states (without a good associative neurointerface they will be undirected and lack cognitive content). This allows both deliberate control over emotion, suppressing certain emotions or amplifying others, personality tuning and even changing preferences for things somewhat.

- Attention control systems allow a symbiotic computer to regulate where attention goes. It enables long stretches of focus as well as modes of relaxed wakefulness or automatic detail zooms.

- Syntronic interfaces link a part of the brain to an artificial cortex outside the skull. This is usually used to enhance a particular kind of cognition.

- Autonomous control interfaces link up with midbrain and brainstem systems, allowing control over basic drives and reflexes. This can be used to regulate weight, nausea, pain, put the body into a low-energy coma to save oxygen or instantly wake up if the symbicomp estimates that there is danger.

Syntronics



Syntronics are wedded to their discipline(s): a mathematics syntronic cortex will always be active, always tainting the perceptions and thinking of its owner. A business cortex will do the same. Nevertheless, they

are otherwise normal humans. It is just that they have a tendency to find ordinary humans limited (unless they work in their speciality field) and to withdraw into their comfortable mental worlds. As the saying goes, syntronics works best for people who are already half otaku.

Syntronics are not superintelligent, they tend just to have certain mental capacities hyper-extended. Beyond a certain point what is smart simply depends on the context or environment, and what works in a lab is usless in real life. As many syntronics point out, their abilities work perfectly within the Society of Mind or the stock market (where they are indeed very smart) but not very well in ordinary physical life. Attempts to create "genuine" superintelligence in the "real world" have been mixed, since there are so many different kinds of "real world".

Syntronic characters cannot go further than ~300 kilometers from their cortex or the delays become too large to maintain connection.

One promising offshoot is the social superintelligence. Expanding social perception, mirroring, empathy and linguistics have enabled syntronic enhancements that help interacting with other people. One of the problems is that being able to understand, simulate and manipulate other people while keeping sympathic emotions under control risks creating "effective sociopaths": while they may have a conscience and start out with normal emotions they seem to manipulate others as a matter of fact. The enhanced teacher will manipulate group dynamics to get the kids interested and grow, the businessman will influence people to make more efficient teams and help the company even if they do not use their power to wreck the competition psychologically.

Host syntronics
There have been attempts at culturing Host cortex, with very bad results. The currently most successful approach is to have an ordinary AM-node, but to use an external syntronic cortex based on scanned neural network connections to help the host run the node. This setup tends to be shaky, but when it works it enables amazing feats of neogenetic cognition.

Pleasure syntronics
The idea was to cultivate cortex better able to experience pleasures. The result has been somewhat problematic: the pleasure is experienced within the syntronic tissue, but since there is no link to the motivation system it is not addictive. While this enables safe usage, users seldom feel motivated to continue. If they connect to motivation they will instead become instantly addicted. The experience is usually described as "an indefinable feeling", "a trance of pleasure" or "It is like an emotional wave striking me again and again.

Full syntronics
They remove their brain and place it with the syntronic tissue, running their bodies remotely or using biobots.

Sectioning

Copying brains to computers have recently become possible thanks to nanocomputer capacities and effective tissue scanning systems. The method is slow and expensive, but works: the brain is fixed chemically, frozen, sliced into a myriad blocks, scanned by nanomicroscopes, interpreted and turned into a simulation. On the upside it can allow immortality as a digital copy. On the downside it is error-prone – there are often small virtual lesions, the simulated brain chemistry and the body are rarely "right". Simulated people often say they feel "sectioned".