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Homework 4

NiMic: the Mobile Phone of the 22nd Century

For my future mobile phone design I've pushed the limits of ubiquitous computing to the point of post-ubiquitous. Due to assumed increases in our knowledge about nanotechnology, human cognition, and neuroscience I have envisioned NiMic: the Neurally-linked, internal Mobile interface cell phone.

How NiMic functions on a technical level is simple. The user swallows a pill containing four distinct nano-neuromachine systems: one each binding to the visual, auditory, and motor cortices, and another acting as a central processing, controlling, and linking system and signal aerial scattered across the cerebrum. The machines work with extreme efficiency, drawing power from the body's chemical and electrical potential. Once the user swallows the pill, it is only a matter of hours before he or she can begin communicating nearly effortlessly.

Unlike physical mobile devices which one can forget, accidentally destroy, or set incorrectly so as to cause embarrassment, e.g. a phone ringing during an important meeting, NiMic stays with you at all times, inside your head. Due to its connection to your auditory and visual systems, NiMic will alert you of a call by stimulating those areas of the brain and transmitting a predefined signal to your conscious mind. Since these stimuli are completely internal, those around you will be unaware and undisturbed by your incoming call.

Before using NiMic successfully, the user's alpha waves and other measurable mental output would need to be measured and analyzed in response to their thought patterns, especially in the imperative. For example, if a user wanted to call their friend, let's say Jane, they would need to say or think "out loud" that command - call Jane. The user would have the option of either thinking it or speaking it - the nano-neuromachine attached to the Broca's area would parse the electrochemical signals corresponding to the user's thought for content and semantics or detect and transmit the acoustic signal from the user's vocal chords.

After thinking the accept command on an incoming call, the user will be able to talk as if into a handset. The user's unspoken, processed thoughts can also be transmitted as synthesized speech. The caller's speech will be received as if the user's ear were against a handset. The user can alter the paralinguistic features of their unspoken, processed speech through the motion of their hands, mimicking the physical patterns of actual speech.

The ability of the system to project auditory signals into the brain can be augmented by the projection of visual signals. This re-creates the experience of using a heads-up display, but without the cumbersome optical system. In conjunction with motor context monitoring, this system could operate much like a computer windowing and menu system, providing the user an alternative method of operating the device.

The inseparability of NiMic and the user creates new challenges for the user. The foremost problem is intrusion - the user will always receive calls or be alerted about missed calls or messages unless they deactivate the device. The NiMic addresses this by giving the user an activation toggling command. NiMic can also register the user's delta waves and deactivate during deep sleep or during predefined hours. Another challenge is preventing the user from transmitting speech-thought they do not want transmitted. This is avoided by processing 'speech' that is above a certain measurable threshold and is present at the front
of our consciousness.

The users of NiMic will face some social challenges. Societal norms have been reshaped dramatically regarding public cell phone usage. Particularly, the users of hands-free units tend to draw the ire and curiosity of those around them, creating a situation where a stranger thinks the caller is engaging him or her in conversation, when in fact, they are speaking on a cell phone. Without the visual indication of an earpiece, one tends to bring the caller's sanity into question. For this manner, it might be necessary for the future early NiMic adopter to have such an earpiece to broadcast his or her use of a cell phone.

The size of cellular devices has decreased rapidly over the last thirty years, and presumably, mobile phones will be small enough to justify implantation in the near future. Eventually, NiMic or similar biointegrated communication devices will be the normal design for cell phones. However, in the trial case, NiMic would be used by those individuals who have lost normal speech-hearing communication abilities. This would allow those who have lost hearing or speech to communicate and regain their productive life without having to overcome the learning curve of sign language.