BCI Cymatics

Combining Brain Computer Interface and Cymatics to Explore New Forms of Communication

Description

Brain computer interface (BCI) is a non-invasive technology which is currently able to process motor control brain commands into engineeriable frequencies. For example, the "thought" of making a fist equates to one electrical signal, while the "thought" of opening your fist equates to another. A series of basic muscle motor control commands, generated by concentration, can be captured and assigned specific frequencies.

Cymatics - or visible vibration - is the science of how vibration manifests through different media. One common vibrational source used in cymatics is lower frequency sound tones. This vibration is connected to some surface; the surface contains a media: water, sand, crystalline particles, for example. Specific vibrations manifest specific shapes. Vibrations in some harmonic proportion typically produce symmetrical, geometric symbols, ascending in complexity as the consonant vibration increases.
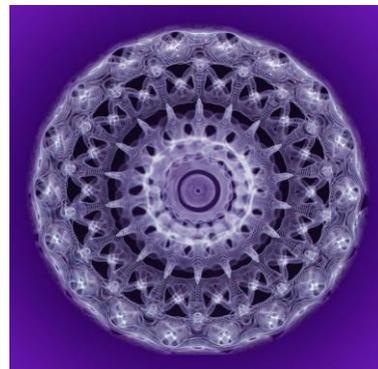

Muse - BCI headset
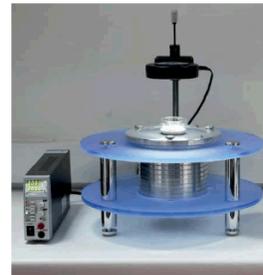
CymaScope
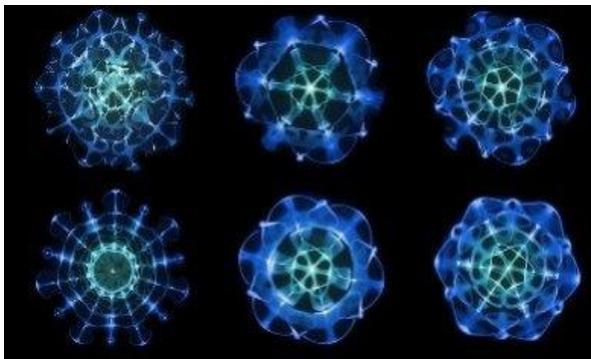
Water cymatics - Holographic imagery

The BCI Cymatics project is designed to combine off the shelf BCI technology, computer processors, and the latest liquid cymatic technology in an attempt to begin a new form of communication. A computer processor would take the BCI generated signal and convert it into a sonic vibration. Initially, an agreed upon set of BCI commands would be assigned specific sonic frequencies, much like a linear alphabet. As the BCI technology progresses, the migration is toward symbology; much more language complexity will be made available.

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Intended Use & Purpose

This BCI Cymatics technology is important to better understand more complex forms of communication and the role of vibration. Cymatics, particularly using water as the medium, can capture the quasi-holographic properties of sonic vibrations. This introduces a new dimension to sound vibration. We normally associate sound to hearing, one-dimensional. In this context sound is also visual, 3-dimensional (holographic). More subtlety and complexity can be introduced.

Dunedain believes this technology would be particularly effective for the following people:
- Autistic
- Hearing impaired
- Persons in a coma
- Those suffering from Multiple Sclerosis, Parkinson's, dementia, etc.

Current BCI technology can be relatively easily tailored to convert brain signals to sonic vibrations. Initially, these signals can be assigned to specific cymatics shapes - a pre-agreed upon starting point of communication. This would quickly evolve into more complex exchanges; as BCI technology improves, these new cymatic holograms are incorporated into the new "language".

Dunedain is also exploring the possibility of making this BCI Cymatics a networked experience. One or more cymatic devices would reside in a fixed location, like an Internet computer server. Remote users would be logged in, wearing their BCI headset. Their "communication hologram" would be visible to all networked users. A conversation would be recorded and made visible.

Status

Dunedain is currently in discussions with Giant Astronaut (giantastronaut.com) to develop this BCI-to-processor-to-Cymatics communication device. We are at the early design phase. Because the separate technologies already exist (BCI headset with software, processors to handle input signals, and cymatics technology), we feel the primary challenges lie in integrating the systems. As BCI technology improves, upgraded headsets will be incorporated fairly easily. New BCI signals made available are simply handled by the processor and sent to the cymatics device. No modifications need to be made.

We are looking at the following technologies to incorporate into one device:
- Open BCI (openbci.com)
- Muse (choosemuse.com)
- John Reid - Cymascope (cymascope.com)
- Dunedain - Magneto

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Budget, Resources, Timeline

The BCI Cymatics project is divided into two proof of concept phases. The first would focus on proving out the basic premise of capturing simple BCI commands, sending them to a processor, and rendering consistent cymatics shapes. The second would focus on the holographic nature of the liquid cymatics and the remote/networked capabilities.

Project	Scope	Resources	Estimate	Duration
BCI Cymatics: Phase 1	OpenBCI headset, processor, Magneto-like cymatics display.	Dunedain GiantAstronaut BCI expert	$750,000	6 months
BCI Cymatics: Phase 2	OpenBCI and/or Muse headset, CymaScope-like cymatics display, remote networking, shared experience.	Dunedain GiantAstronaut John Reid - CymaScope BCI expert Linguist	$1,500,000	12 months

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