This is a Forecast of

AI SPATIAL COMPUTING GLASSES,

SCG Technology:

-SCG SMART GLASSES with AI VIRTUAL COMPUTER SCREEN, AR, OR XR MODES. By 2050, SCG Spatial Computing Glasses will be (IBS) International Biometric Society, and (PS) Psychometric Society, Neuro-Algorithm Program Certified. Used with DataLink SCG AI Agent WRISTBAND/CUFF Device for intracranial interface cloud computing, capable of on-command dissemination of biometric and psychometric data, at 40 Hz, directly into the user's mind.

-SCG SMART AI GLASSES are the gateway to sentient, QMD interactive Global A.I. or integral interactive global INTERNET consciousness. The Quantum Molecular Deduction era is an evolutionary advance in intuitive intracranial interface cloud computing, capable on command of disseminating biometric and psychometric data, at 40 Hz, directly into the user's mind, via an area of the brain's claustrum complex called the endopiriform, located deep within each hemisphere; consciousness and thought interface with technology. Commercially, by 2050, as SCG Technology evolves and becomes more refined, sophisticated, and miniaturized, smart wearables will be seen as a sign of prestige and an essential tool for successful daily living.

DARPA's further research might make for interesting feasibility studies:

- UARC RESEARCH and DEVELOPMENT OF SCG TECHNOLOGY for COMMERCIAL APPLICATION
- FFRDC RESEARCH and DEVELOPMENT of SCG TECHNOLOGY for MILITARY APPLICATION

APPLICATIONS of SPATIAL COMPUTING GLASSES TECHNOLOGY are Limitless for National Security and Economic competitiveness. --G.K.W.

Researchers have discovered the brain circuit that controls our ability to recall information and memories…

> Researchers have identified the specific cell group in the brain that plays a central role in our ability to discriminate familiar and novel things, which is called recognition memory. This discovery is significant as it may impact our understanding -- and treatment -- of several cognitive disorders.

Daily, we encounter new people, situations, and things that require our attention. Fortunately, there is an area in the brain that contributes to consciousness and awareness. This area is called the “Claustrum complex” and is located deep within the brain in each hemisphere.

Today, we know that many diseases related to higher cognitive function, such as Alzheimer’s, schizophrenia, and ADD/ADHD, are closely linked to abnormal function of this particular part of the brain. However, we still do not fully understand how the different parts of the claustrum complex work or how its circuits and communication system are organized.

Researchers at Aarhus University have now uncovered this, and their results identify, down to the cellular level, which part of the claustrum complex controls our ability to discriminate familiar and novel things.

“Our study focuses on an area of the claustrum called the ‘endopiriform,’ which is a relatively unknown brain structure despite its unique brain network and cellular properties,” explains Asami Tanimura, an associate professor, and the lead researcher.

“For the first time, we have dissected the circuit of endopiriform to the hippocampus, and demonstrated how this pathway is crucial for recognition memory.”

Using experiments on mice, researchers were able to observe how the mice’s behavior changed when they respectively ‘turned on’ and ‘turned off’ the activity in this specific cell group.

ONGOING RESEARCH

“We observed that the cells in the endopiriform were active when the mice interacted with new conspecifics or objects, and when we inhibited this cell group, it reduced the mice’s ability to distinguish novel mouse or object from familiar ones,” explained researchers.

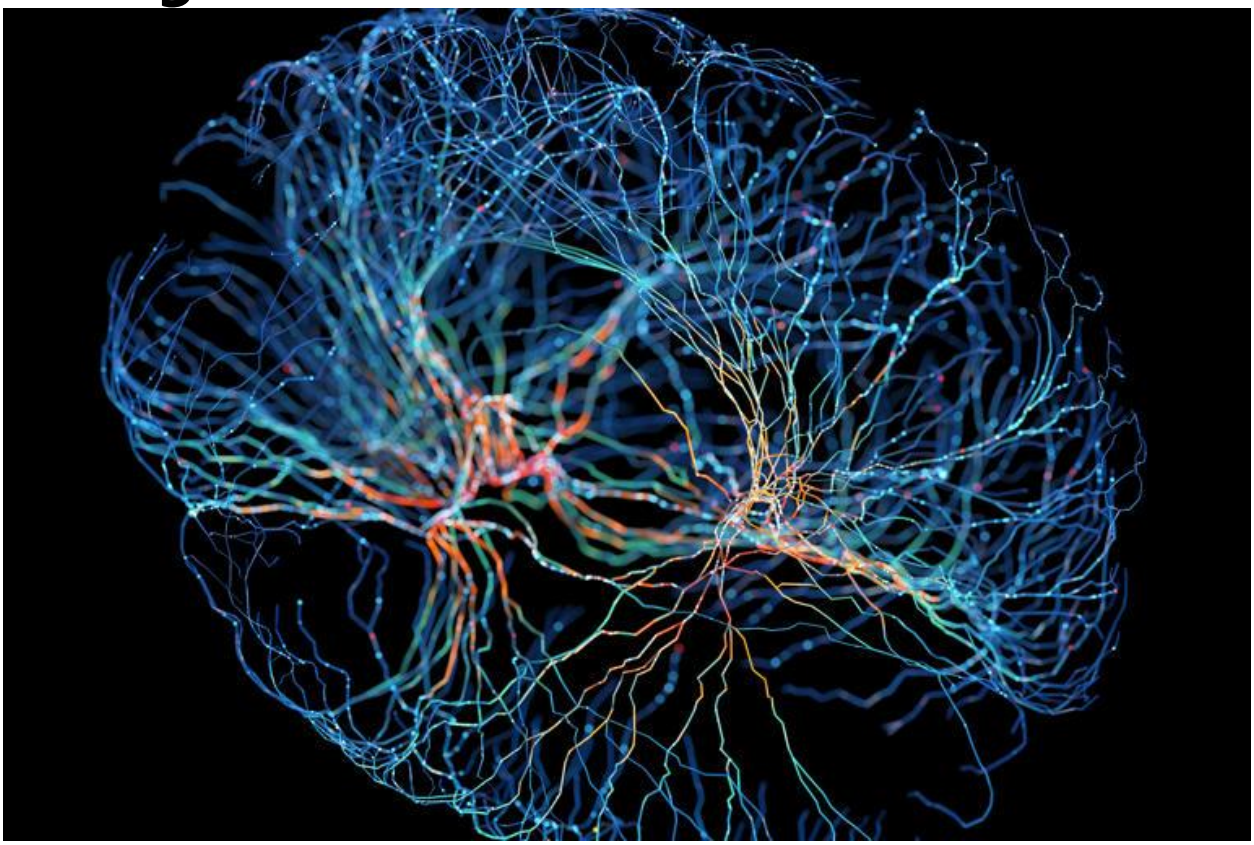
Based on this, the researchers concluded that this specific cell group in the claustrum seems to play a key role in sending a memory-guided attention signal to the hippocampus.

“This is entirely new knowledge about this small but important part of the brain, and it gives us a unique understanding of the special circuit involved in recognition memory,” explain researchers.

What this knowledge might mean, and whether it could lead to the development of new treatment methods targeted at disorders in this part of the brain, remains to be seen. However, Asami and her colleagues are optimistic:

“To develop effective treatment methods, a very detailed understanding of the cells’ circuits is required. With our study, we have at least opened a door that has previously been closed in terms of the specific role of the endopiriform-hippocampal circuit on higher cognitive function.”

Science Fiction? Think Again. Scientists Are Learning How to Decode Inner Thoughts



In recent years, scientists have been working on technology that could help people—such as those paralyzed by strokes or with neurological conditions like ALS—to communicate. In particular, devices called brain-computer interfaces, or BCIs, pick up electrical signals in the brain as people try to form words, then translate these signals out loud. But in a new study, published Thursday in the journal *Cell*, researchers report they have decoded four participants' inner voices for the first time, with up to 74 percent accuracy.

"It's a fantastic advance," Christian Herff, a neuroscientist at Maastricht University in the Netherlands who was not involved in the new study, tells the *New York Times*' Carl Zimmer, adding that the technology not only helps people speak who otherwise can't but also improves scientists' understanding of how language works.

In previous uses of BCIs, researchers asked patients who couldn't speak to try to physically form words. This created signals of so-called attempted speech in the brain, which were picked up by implanted electrodes and decoded with a computer algorithm. This process, however, could be tiring and uncomfortable for users, as Erin Kunz, an electrical engineer at Stanford University, tells *Science's* Annika Inampudi.

So, Kunz and her team decided to try to investigate whether implanted electrodes could pick up a patient's inner voice. If it could, operating the device might become easier for users. But this research was also meant to investigate questions around privacy—could these devices also pick up unintentional speech? After all, our inner voices might say things we don't want others to hear.

Then, the team trained the computer system on the signals produced when participants thought words from a 125,000-word vocabulary. When the users then thought sentences with these words, the device translated the resulting brain activity. The technology produced words with an error rate of 26 to 54 percent, making it the most accurate attempt to decode inner speech to date, *Science* reports.

In another experiment, participants were asked to tally circles on a screen as the device tried to translate their thoughts. This was meant to test whether the computer would pick up internal thoughts that the participants weren't told to say, and in some cases, the system picked up a number.

Beyond helping people speak who otherwise couldn't, the findings show that, at least for some people, language plays a role in the process of thought, Herff tells the *New York Times*. It also reveals neural differences between attempted and internal speech, Silvia Marchesotti, a neuroengineer at the University of Geneva who wasn't involved in the research, tells *Nature*'s Gemma Conroy.

But the researchers say they're not done yet—and they're working toward even better outcomes.

"The results are an initial proof of concept more than anything," Kunz tells the *New York Times*. "We haven't hit the ceiling yet."

Fascinating new neuroscience study shows the brain emits light through the skull

A new study published in *iScience* provides evidence that the human brain emits extremely faint light signals that not only pass through the skull but also appear to change in response to mental states. Researchers found that these ultraweak light emissions could be recorded in complete darkness, and they appeared to shift in response to simple tasks like closing the eyes or listening to sound. The findings suggest that this faint brain light may carry information about brain activity—possibly opening the door to a new way of studying the brain (photoencephalography).

All living tissues release tiny amounts of light during normal metabolism, known as ultraweak photon emissions. This happens when excited molecules return to a lower energy state and emit a photon in the process. The light is incredibly faint—about a million times weaker than what we can see—and falls within the visible to near-infrared range. In contrast to bioluminescence, which involves specific chemical reactions like those used by fireflies, ultraweak photon emissions happen constantly in all tissues, without special enzymes or glowing compounds.

The brain emits more of this faint light than most other organs because of its high energy use and dense concentration of photoactive molecules. These include compounds like flavins, serotonin, and proteins that can absorb and emit light. Photon emission rates also seem to rise during oxidative stress and aging and may reflect changes in cell health or communication.

The research team, led by Hayley Casey, Nirosha Murugan, and colleagues at Algoma University, Tufts University, and Wilfrid Laurier University, wanted to know if these faint light emissions could be used to monitor brain activity. Unlike other imaging methods that require stimulation—such as strong magnetic fields or infrared light—measuring UPEs is entirely passive. That means it doesn't introduce anything new to the brain.

The researchers proposed that UPEs might offer a new way to monitor brain function safely and without interference, similar to how EEG tracks electrical brain waves without applying energy. They also wanted to test whether UPEs reflect mental states like resting with eyes closed or responding to sound, and whether these signals match known changes in electrical brain rhythms.

The researchers recruited 20 healthy adult participants and measured both UPEs and brain electrical activity while the participants sat in a dark room. The setup included photomultiplier tubes placed near the occipital and temporal regions of the head, where the brain processes visual and auditory information. A third sensor recorded background light. At the same time, participants wore a cap with electroencephalography sensors to record electrical brain rhythms.

Participants went through a ten-minute recording session that included five conditions. First, they sat with eyes open and then with eyes closed. Next, they listened to a simple repeating auditory stimulus, followed by another eyes-closed period, and finally another eyes-open period. The aim was to see whether brain UPEs responded to known manipulations of brain activity, particularly the shift in alpha rhythms that occurs when people close their eyes.

Photon emissions were recorded in short time intervals and analyzed for variability, frequency content, and stability over time. The team compared the results to background signals and examined correlations with electrical brain rhythms recorded at the same time.

The researchers found that the light emitted from the brain could be distinguished from background light based on its variability and complexity. Brain UPEs showed greater entropy and a more dynamic signal than background recordings. These emissions also showed a distinctive frequency profile below 1 Hz, meaning that the light fluctuated in slow rhythmic patterns roughly once every one to ten seconds. This signature was not present in the background light and was especially pronounced in the occipital region.

The researchers also observed that brain UPEs appeared to reach a steady state during each task, particularly by the end of the two-minute recording segments. These stable patterns shifted when participants moved between eyes-open and eyes-closed conditions, suggesting that the emissions reflect changes in the brain's internal state. However, the direction of change was not consistent across all participants, possibly reflecting individual differences or the complexity of the underlying metabolic processes.

When the researchers compared UPEs to brain electrical rhythms, they found modest correlations. For instance, alpha rhythms—often associated with relaxed wakefulness and increased during eyes-closed states—correlated with photon emissions from the occipital region, but only when the participants' eyes were closed. They also found some associations between UPE variability and temporal lobe rhythms during auditory stimulation. Still, the relationships were not strong, and many expected correlations did not emerge, highlighting the need for further research.

While the findings are promising, the authors caution that this was a preliminary study with several limitations. The sample size was small, and the recording equipment only covered a few areas of the head. The sensors also detected a wide range of wavelengths, which may have obscured more specific light patterns. More precise filters or detectors could help uncover wavelength-specific signatures related to different brain functions.

The researchers also suggest that expanding the sensor array could improve spatial resolution and help identify the origins of UPEs within the brain. Because these emissions are tied to metabolic activity, they may come from a variety of cell types, including neurons and glial cells, and from different depths in the brain. Developing methods to localize these signals will be an important next step.

The study did not include measurements from other parts of the body, which could help clarify whether similar light emissions occur in non-brain tissues and how they differ. Including more participants and exploring variations based on age, sex, or health status may also reveal meaningful patterns. In the future, machine learning and advanced imaging techniques may allow researchers to decode UPE patterns and use them to detect brain disorders or monitor brain health.

"We view the current results as a proof-of-concept demonstration that patterns of human-brain-derived UPE signals can be discriminated from background light signals in darkened settings despite very low relative signal intensity," the researchers wrote. "Photoencephalography would be maximally non-invasive (i.e., passive recording) with high temporal resolution, like EEG or MEG; however, the measurement of UPEs would be linked to oxidative metabolism with several clinical applications described elsewhere. Future studies may find success in using select filters and amplifiers to sieve and enhance UPE signal features from healthy and diseased brains."

The study, "Exploring ultraweak photon emissions as optical markers of brain activity," was authored by Hayley Casey, Isabella DiBerardino, Mattia Bonzanni, Nicolas Rouleau, and Nirosha J. Murugan.