

Cft Correspondence Consciousness

Holographic principle

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The holographic principle is a property of string theories and a supposed property of quantum gravity that states that the description of a volume of space can be thought of as encoded on a lower-dimensional boundary to the region – such as a light-like boundary like a gravitational horizon. First proposed by Gerard 't Hooft, it was given a precise string theoretic interpretation by Leonard Susskind, who combined his ideas with previous ones of 't Hooft and Charles Thorn. Susskind said, "The three-dimensional world of ordinary experience—the universe filled with galaxies, stars, planets, houses, boulders, and people—is a hologram, an image of reality coded on a distant two-dimensional surface." As pointed out by Raphael Bousso, Thorn observed in 1978 that string theory admits a lower-dimensional description in which gravity emerges from it in what would now be called a holographic way. The prime example of holography is the AdS/CFT correspondence.

The holographic principle was inspired by the Bekenstein bound of black hole thermodynamics, which conjectures that the maximum entropy in any region scales with the radius squared, rather than cubed as might be expected. In the case of a black hole, the insight was that the information content of all the objects that have fallen into the hole might be entirely contained in surface fluctuations of the event horizon. The holographic principle resolves the black hole information paradox within the framework of string theory. However, there exist classical solutions to the Einstein equations that allow values of the entropy larger than those allowed by an area law (radius squared), hence in principle larger than those of a black hole. These are the so-called "Wheeler's bags of gold". The existence of such solutions conflicts with the holographic interpretation, and their effects in a quantum theory of gravity including the holographic principle are not yet fully understood.

List of unsolved problems in physics

AdS/CFT correspondence in string theory. Similarly, can quantum gravity in a de Sitter space be understood using dS/CFT correspondence? Can the AdS/CFT correspondence

The following is a list of notable unsolved problems grouped into broad areas of physics.

Some of the major unsolved problems in physics are theoretical, meaning that existing theories are currently unable to explain certain observed phenomena or experimental results. Others are experimental, involving challenges in creating experiments to test proposed theories or to investigate specific phenomena in greater detail.

A number of important questions remain open in the area of Physics beyond the Standard Model, such as the strong CP problem, determining the absolute mass of neutrinos, understanding matter–antimatter asymmetry, and identifying the nature of dark matter and dark energy.

Another significant problem lies within the mathematical framework of the Standard Model itself, which remains inconsistent with general relativity. This incompatibility causes both theories to break down under extreme conditions, such as within known spacetime gravitational singularities like those at the Big Bang and at the centers of black holes beyond their event horizons.

Quantum entanglement

AdS/CFT correspondence allows a quantum gravitational system to be related to a quantum field theory without gravity. Using this correspondence, Mark

Quantum entanglement is the phenomenon where the quantum state of each particle in a group cannot be described independently of the state of the others, even when the particles are separated by a large distance. The topic of quantum entanglement is at the heart of the disparity between classical physics and quantum physics: entanglement is a primary feature of quantum mechanics not present in classical mechanics.

Measurements of physical properties such as position, momentum, spin, and polarization performed on entangled particles can, in some cases, be found to be perfectly correlated. For example, if a pair of entangled particles is generated such that their total spin is known to be zero, and one particle is found to have clockwise spin on a first axis, then the spin of the other particle, measured on the same axis, is found to be anticlockwise. However, this behavior gives rise to seemingly paradoxical effects: any measurement of a particle's properties results in an apparent and irreversible wave function collapse of that particle and changes the original quantum state. With entangled particles, such measurements affect the entangled system as a whole.

Such phenomena were the subject of a 1935 paper by Albert Einstein, Boris Podolsky, and Nathan Rosen, and several papers by Erwin Schrödinger shortly thereafter, describing what came to be known as the EPR paradox. Einstein and others considered such behavior impossible, as it violated the local realism view of causality and argued that the accepted formulation of quantum mechanics must therefore be incomplete.

Later, however, the counterintuitive predictions of quantum mechanics were verified in tests where polarization or spin of entangled particles were measured at separate locations, statistically violating Bell's inequality. This established that the correlations produced from quantum entanglement cannot be explained in terms of local hidden variables, i.e., properties contained within the individual particles themselves.

However, despite the fact that entanglement can produce statistical correlations between events in widely separated places, it cannot be used for faster-than-light communication.

Quantum entanglement has been demonstrated experimentally with photons, electrons, top quarks, molecules and even small diamonds. The use of quantum entanglement in communication and computation is an active area of research and development.

Tramadol

predominant neurological symptoms are seizures and altered levels of consciousness, ranging from somnolence to coma. Seizures are particularly notable

Tramadol, sold under the brand name Tramal among others, is an opioid pain medication and a serotonin–norepinephrine reuptake inhibitor (SNRI) used to treat moderately severe pain. When taken by mouth in an immediate-release formulation, the onset of pain relief usually begins within an hour. It is also available by injection. It is available in combination with paracetamol (acetaminophen).

As is typical of opioids, common side effects include constipation, itchiness, and nausea. Serious side effects may include hallucinations, seizures, increased risk of serotonin syndrome, decreased alertness, and drug addiction. A change in dosage may be recommended in those with kidney or liver problems. It is not recommended in those who are at risk of suicide or in those who are pregnant. While not recommended in women who are breastfeeding, those who take a single dose should not generally have to stop breastfeeding. Tramadol is converted in the liver to O-desmethyltramadol (desmetramadol), an opioid with a stronger affinity for the μ -opioid receptor.

Tramadol was patented in 1972 and launched under the brand name Tramal in 1977 by the West German pharmaceutical company Grünenthal GmbH. In the mid-1990s, it was approved in the United Kingdom and

the United States. It is available as a generic medication and marketed under many brand names worldwide. In 2023, it was the 36th most commonly prescribed medication in the United States, with more than 16 million prescriptions.

Ketamine

large-scale study based on the semantic similarity of written reports; *Consciousness and Cognition*. 69: 52–69. doi:10.1016/j.concog.2019.01.011. hdl:2268/231971

Ketamine is a cyclohexanone-derived general anesthetic and NMDA receptor antagonist with analgesic and hallucinogenic properties, used medically for anesthesia, depression, and pain management. Ketamine exists as its two enantiomers, S- (esketamine) and R- (arketamine), and has antidepressant action likely involving additional mechanisms than NMDA antagonism.

At anesthetic doses, ketamine induces a state of dissociative anesthesia, a trance-like state providing pain relief, sedation, and amnesia. Its distinguishing features as an anesthetic are preserved breathing and airway reflexes, stimulated heart function with increased blood pressure, and moderate bronchodilation. As an anesthetic, it is used especially in trauma, emergency, and pediatric cases. At lower, sub-anesthetic doses, it is used as a treatment for pain and treatment-resistant depression.

Ketamine is legally used in medicine but is also tightly controlled, as it is used as a recreational drug for its hallucinogenic and dissociative effects. When used recreationally, it is found both in crystalline powder and liquid form, and is often referred to by users as "Ket", "Special K" or simply "K". The long-term effects of repeated use are largely unknown and are an area of active investigation. Liver and urinary toxicity have been reported among regular users of high doses of ketamine for recreational purposes. Ketamine can cause dissociation and nausea, and other adverse effects, and is contraindicated in severe heart or liver disease, uncontrolled psychosis. Ketamine's effects are enhanced by propofol, midazolam, and naltrexone; reduced by lamotrigine, nimodipine, and clonidine; and benzodiazepines may blunt its antidepressant action.

Ketamine was first synthesized in 1962; it is derived from phencyclidine in pursuit of a safer anesthetic with fewer hallucinogenic effects. It was approved for use in the United States in 1970. It has been regularly used in veterinary medicine and was extensively used for surgical anesthesia in the Vietnam War. It later gained prominence for its rapid antidepressant effects discovered in 2000, marking a major breakthrough in depression treatment. A 2023 meta-analysis concluded that racemic ketamine, especially at higher doses, is more effective and longer-lasting than esketamine in reducing depression severity. It is on the World Health Organization's List of Essential Medicines. It is available as a generic medication.

List of U.S. Air Force acronyms and expressions

and Training Plan CFP – Communications Focal Point CFR – Crash Fire Rescue CFT – Cockpit Familiarization Trainer CGO – Company Grade Officer (lieutenants)

This is a list of initials, acronyms, expressions, euphemisms, jargon, military slang, and sayings in common or formerly common use in the United States Air Force. Many of the words or phrases have varying levels of acceptance among different units or communities, and some also have varying levels of appropriateness (usually dependent on how senior the user is in rank). Many terms also have equivalents among other service branches that are comparable in meaning. Many acronyms and terms have come into common use from voice procedure use over communication channels, translated into the NATO phonetic alphabet, or both. Acronyms and abbreviations are common in Officer and Enlisted Performance Reports, but can differ between major commands.

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