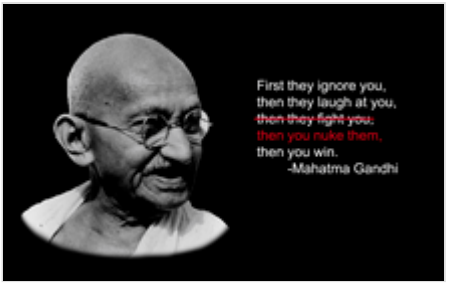
Nuclear Gandhi

Nuclear Gandhi is a video game urban legend purporting the existence of a software bug in the 1991 strategy video game *Civilization* that would eventually force the pacifist leader Mahatma Gandhi to become extremely aggressive and make heavy use of nuclear weapons. The claim was mentioned on the TV Tropes wiki in 2012, and continued until 2020, when the series' creator, Sid Meier, confirmed that the bug would have been impossible in the original game.[1] Gandhi was programmed to exhibit this behavior in *Civilization V*, released in 2010, and it is unclear whether this led to the belief that the behavior had also been present in earlier games.



An example of Nuclear Gandhi as an Internet meme

While fictional, Nuclear Gandhi is one of the most recognizable video game glitches and has been used as an example of integer overflow in computer science, and was included as an Easter egg in other games in the *Civilization* series.

Background

According to the legend, each leader's game AI in *Civilization* had a parameter that described their aggression on a scale from 1 to 10, with 1 being least aggressive and 10 most aggressive.[2][3] Other sources say the scale went from 1 to 12.[4] Indian leader Mahatma Gandhi was the only leader in the game with the lowest possible aggression rating of 1[5] and, as a result, was only able to wage defensive wars.[6] Once the AI changed its government form to democracy, which was preferred by peaceful nations such as India,[3] its aggression level decreased by 2. In the case of Gandhi, this would lead to an aggression level of −1.[7]

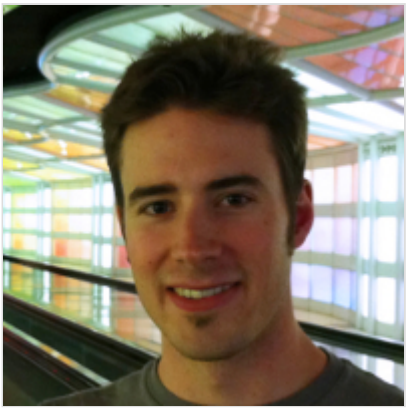
According to the legend, the aggression level was stored as an 8-bit unsigned integer variable that could only store values in the range from 0 to 255 (or $2^8 - 1$), and the negative value would therefore result in an integer overflow, with the value being stored as 255[7] and Gandhi supposedly becoming about 25 times more aggressive than the most aggressive leaders in the game.[6] In *Civilization*'s technology tree, nuclear weapons are generally unlocked only after democracy, so Gandhi's aggression level would have already spiked by the time India became nuclear-capable. This led to India suddenly attacking other civilizations with nuclear missiles.[2] Some versions of the story say that the bug was fixed in later versions of the game,[8] others the developers were so amused by it that they deliberately re-implemented as an Easter egg.[2][9][8] Some versions of the story claim that the bug first appeared in *Civilization II*.[4]

In reality, according to the *Civilization II* lead game designer Brian Reynolds, there were only three possible aggression levels in *Civilization*, and even though Gandhi's AI had the lowest possible aggression level, he shared it with one third of all leaders. Additionally, based on his memories of *Civilization*'s source code, Reynolds stated that there was no unsigned variable in this section of code and that leaders could not act more aggressively than the most aggressive leaders of the game. A leader with

an aggression level of 255 would act the same way as a leader with an aggression level of 3.[10] According to Sid Meier, since all integer variables are signed by default in both C and C++ (the programming languages of *Civilization* and *Civilization II* respectively), overflow would not have occurred if Gandhi's aggression were set to −1; moreover, the government form does not affect AI aggressiveness at all, so Gandhi's aggression level remained the same throughout the game.[4] During wars, India could use nuclear weapons just like any other civilization, but Gandhi would not use nuclear weapons more often than Abraham Lincoln or any other peaceful leaders.[3][4][10] One possible origin of the legend could be India's tendency to discover nuclear technology before most of its opponents because of the peaceful scientific nature of this civilization.[10][4] Reynolds noted that all leaders in the game become "pretty ornery" after their acquisition of nuclear weapons, and suggested that this behavior simply seemed more surprising and memorable when it happened to Gandhi.[10]

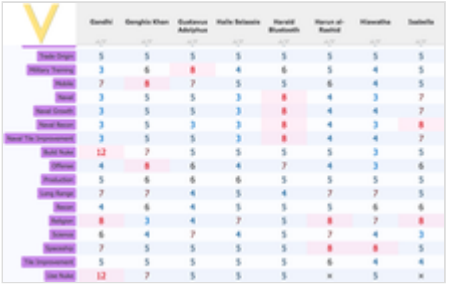
Appearances

Through *Civilization IV*, a popular misconception held that Gandhi was "still" programmed with a tendency to use nuclear weapons as an Easter egg, but no such behavior was purposely added to the games by Firaxis. The first such intentional inclusion of Nuclear Gandhi was in *Civilization V*. *Civilization V* lead game designer Jon Shafer set Gandhi's "Build Nuke" and "Use Nuke" parameters to the highest possible value, 12. Shafer said that he did this as a joke: "it's fun to imagine that an Indian politician promoting Satyagraha may have a desire to nuke his neighbors". Following the game's release in 2010, players noticed Gandhi's incongruous behavior; it was addressed in *The Escapist* magazine's comic *Critical Miss*. Players nicknamed *Civilization V*'s Gandhi "Thermonuclear," "The destroyer of worlds," and "Kurchatov."[11]



Jon Shafer made Gandhi a nuclear weapon enthusiast in *Civilization V*.

Gandhi is actually one of the most peaceful leaders in *Civilization V*, but his artificial intelligence parameters that control building and using of nuclear weapons have the value of 12, which is the highest of any leader. The next three leaders have a value of 8, and most leaders have a value between 4 and 6.[7] To bring more diversity to the gameplay, at the start of each game, *Civilization V* adjusts these parameters by adding a random value between −2 and +2 to each of these two values; in the case of Gandhi, this means the "Build Nuke" and "Use Nuke" parameters will never go lower than the maximum rating: 10 out of 10.[12]



An artificial intelligence configuration of *Civilization V*. Gandhi's high values of "Build Nuke" and "Use Nuke" favors are clearly visible.

Civilization VI introduced a secret agenda mechanic that regulates the artificial intelligence behavior. Each leader has two agendas: the first is constant and based on each leader's personal history, and the second one (as well as a third one in *Civilization VI: Gathering Storm*) is chosen randomly at the start of each game. Gandhi's fixed goal is "Peacekeeper": Gandhi is much less likely to start wars, and disdains civilizations that do, as well as

appreciating those that do the opposite. However, he has a fixed 70% probability of getting "Nuke Happy" as his secondary agenda, which causes him to focus on building nukes, appreciate civilizations that do, and disdain civilizations that do not.[13][14]

Urban legend

In 2012, 21 years after the original *Civilization* was released, the TV Tropes page for *Civilization* was edited by user Tunafish to add a claim that a software bug caused Gandhi to act much more aggressively, but did not include any proof for the claim.[15][4][3] In November, the same information was added to Wikia.[4] According to Sid Meier, over the next two years, the story spread across the Internet, and each time someone doubted it, a link to a wiki was used as a proof.[3]

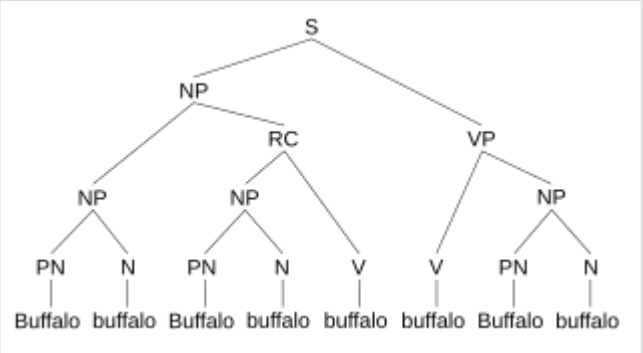
In 2014, the story gained publicity after a reposted *Critical Miss* comic caused a discussion in the comment section on Reddit over why Gandhi was made that aggressive.[3] Ten days later, the video game news website *Kotaku* posted the article "Why Gandhi Is Such An Asshole In Civilization",[7] which prompted other news websites and blogs to republish the information.[3][4] Soon, "Nuclear Gandhi" became a common video game Internet meme and joke.[3] Moreover, as the "Nuclear Gandhi" meme spread, many people remembered that they were particularly annoyed by India in the first games of *Civilization* series, a false memory attributable to the Mandela effect.[3] Information about "Nuclear Gandhi" was later added to *Know Your Meme*, which stated that the bug first appeared in *Civilization II*.[4]

On June 18, 2019, Firaxis marketing manager Kevin Schultz posted a tweet stating that he was going offline for two weeks due to a business trip to China, and offered to reflect on the question, "What if the widely shared and reposted story about Gandhi's love for nukes in the original *Civilization* being caused by a bug is totally false?" This prompted ex-*Eurogamer* columnist Chris Bratt to start a journalistic investigation.[6]

Bratt contacted 2K's PR department and asked for an interview with a Firaxis representative, but his request was denied. Bratt then contacted ex-Firaxis game designer Bruce Shelley, who stated that he did not remember whether the glitch existed, since the development of *Civilization* was 30 years ago: "I vaguely remember an issue with Gandhi, but the guy you would have to speak with is Sid [Meier]." The next person Bratt contacted was lead *Civilization II* game designer Brian Reynolds, who replied: "Although it's been ~20 years since I've seen the Civ 1 code, I can still tell you with 99.99% certainty the Gandhi bug is completely apocryphal." Bratt contacted 2K and Sid Meier once again but did not receive a direct refutation. Meier stated that he did not know the correct answer, but he thinks that the urban legend is a good thing: "given the limited technology of the time, the original Civ was in many ways a game that took place mainly in players' imaginations", so "I'd be reluctant to limit what that player can imagine by introducing too many of my thoughts". Bratt posted a YouTube video with his investigation's findings.[10] Later, in an *Ars Technica* interview, Sid Meier similarly stated that the bug was possible, "but it was not intentional".[16]

Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo

"**Buffalo buffalo Buffalo buffalo buffalo buffalo Buffalo buffalo**" is a grammatically correct sentence in English that is often presented as an example of how homonyms and homophones can be used to create complicated linguistic constructs through lexical ambiguity. It has been discussed in literature in various forms since 1967, when it appeared in Dmitri Borgmann's *Beyond Language: Adventures in Word and Thought*.



Simplified parse tree:
S = sentence
NP = noun phrase
RC = relative clause
VP = verb phrase
PN = proper noun
N = noun
V = verb

The sentence employs three distinct meanings of the word *buffalo*:

- As an attributive noun (acting as an adjective) to refer to a specific place named Buffalo, such as the city of Buffalo, New York;
- As the verb *to buffalo*, meaning (in American English[1][2]) "to bully, harass, or intimidate" or "to baffle"; and
- As a noun to refer to the animal (either the true buffalo or the bison). The plural is also *buffalo*.

A semantically equivalent form preserving the original word order is: "Buffalonian bison that other Buffalonian bison bully also bully Buffalonian bison."

City of Buffalo, New York

Sentence construction

The sentence is unpunctuated and uses three different readings of the word "buffalo". In order of their first use, these are:

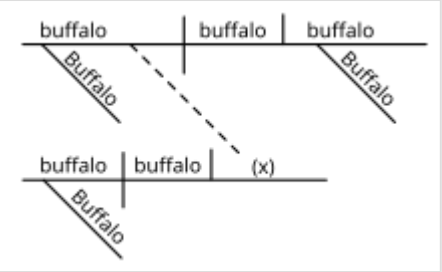
- **a.** a city named Buffalo. This is used as a noun adjunct in the sentence;
- **n.** the noun *buffalo*, an animal, in the plural (equivalent to "buffaloes" or "buffalos"), in order to avoid articles.
- **v.** the verb "buffalo" meaning to outwit, confuse, deceive, intimidate, or baffle.

American bison, colloquially referred to as buffalo

The sentence is syntactically ambiguous; one possible parse (marking each "buffalo" with its part of speech as shown above) is as follows:

Buffalo[a] buffalo[n] Buffalo[a] buffalo[n] buffalo[v] buffalo[v] Buffalo[a] buffalo[n].

When grouped syntactically, this is equivalent to: [(Buffalonian bison) (Buffalonian bison intimidate)] intimidate (Buffalonian bison).



Reed–Kellogg diagram of the sentence

Because the sentence has a restrictive clause, there can be no commas. The relative pronouns "which" or "that" could appear between the second and third words of the sentence, as in *Buffalo buffalo that Buffalo buffalo buffalo buffalo Buffalo buffalo*; when this pronoun is omitted, the relative clause becomes a reduced relative clause.

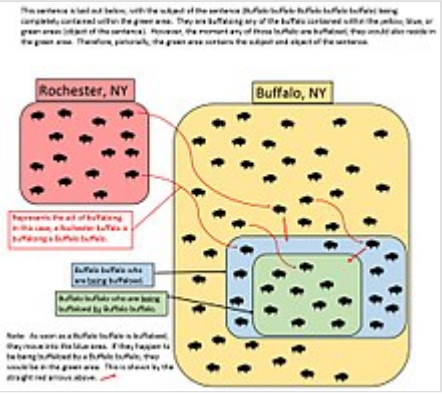
An expanded form of the sentence that preserves the original word order is: "Buffalo bison that other Buffalo bison bully also bully Buffalo bison."

Thus, the parsed sentence claims that bison who *are intimidated or bullied by bison* do themselves *intimidate or bully bison* (at least in the city of Buffalo – implicitly, Buffalo, New York):

1. Buffalo buffalo (animals called "buffalo" from the city of Buffalo) [that] Buffalo buffalo buffalo (that the same kind of animals from the city bully) buffalo Buffalo buffalo (bully these animals from that city).
2. [Those] buffalo(es) from Buffalo [that are intimidated by] buffalo(es) from Buffalo intimidate buffalo(es) from Buffalo.
3. Bison from Buffalo, New York, who are intimidated by other bison in their community in turn intimidate other bison in their community.
4. *The* buffalo *from* Buffalo *who are* buffalo*ed by* buffalo *from* Buffalo buffalo (verb) *other* buffalo *from* Buffalo.
5. Buffalo buffalo (main clause subject) [that] Buffalo buffalo (subordinate clause subject) buffalo (subordinate clause verb) in turn buffalo (main clause verb) Buffalo buffalo (main clause direct object).
6. Buffalo from Buffalo [that] buffalo [from] Buffalo buffalo [in turn] buffalo buffalo [from] Buffalo.

Usage

Thomas Tymoczko has pointed out that there is nothing special about eight "buffalos";[3] any sentence consisting solely of the word "buffalo" repeated any number of times is grammatically correct. The shortest is "Buffalo!", which can be taken as a verbal imperative instruction to bully someone ("[You,] buffalo!") with the implied subject "you" removed,[4]:99–100,104 or, as a noun exclamation, expressing e.g. that a buffalo has been sighted, or as



A diagram explaining the sentence

an adjectival exclamation, e.g. as a response to the question, "where are you from?" Tymoczko uses the sentence as an example illustrating rewrite rules in linguistics.[4]:104–105

Diagram using a comparison to explain the buffalo sentence

Origin

The idea that one can construct a grammatically correct sentence consisting of nothing but repetitions of "buffalo" was independently discovered several times in the 20th century. The earliest known written example, "Buffalo buffalo buffalo buffalo", appears in the original manuscript for Dmitri Borgmann's 1965 book *Language on Vacation*, though the chapter containing it was omitted from the published version.[5] Borgmann recycled some of the material from this chapter, including the "buffalo" sentence, in his 1967 book, *Beyond Language: Adventures in Word and Thought*.[6]:290 In 1972, William J. Rapaport, then a graduate student at Indiana University, came up with versions containing five and ten instances of "buffalo".[7] He later used both versions in his teaching, and in 1992 posted them to the LINGUIST List.[7][8] A sentence with eight consecutive buffalos is featured in Steven Pinker's 1994 book *The Language Instinct* as an example of a sentence that is "seemingly nonsensical" but grammatical. Pinker names his student, Annie Senghas, as the inventor of the sentence.[9]:210

Neither Rapaport, Pinker, nor Senghas were initially aware of the earlier coinages.[7] Pinker learned of Rapaport's earlier example only in 1994, and Rapaport was not informed of Borgmann's sentence until 2006.[7]

Versions of this linguistic oddity can be constructed with other words which similarly simultaneously serve as collective noun, adjective, and verb, some of which need no capitalization (such as "police").[10]

See also

General:

- Antanaclasis
- *Eats, Shoots & Leaves*
- List of linguistic example sentences
- Polyptoton
- Semantic satiation

Other linguistically complex sentences:

- James while John had had had had had had had had had had had a better effect on the teacher
- Lion-Eating Poet in the Stone Den (a Classical Chinese poem in which every syllable is pronounced as *shi*, though with varying tones).
- That that is is that that is not is not is that it it is

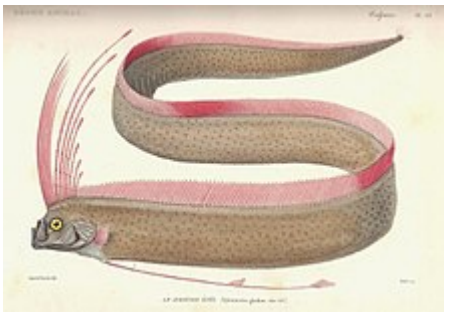
Oarfish

Oarfish are large and extremely long pelagic lampriform fish belonging to the small family Regalecidae.[1] Found in areas spanning from temperate ocean zones to tropical ones, yet rarely seen, the oarfish family contains three species in two genera.[2] One of these, the giant oarfish (*Regalecus glesne*), is the longest bony fish alive, growing up to about 8 m (26 ft) in length.[3]

The common name *oarfish* is thought to allude either to their highly compressed and elongated bodies, or to the now discredited belief that the fish "row" themselves through the water with their pelvic fins.[4][5] The family name Regalecidae is derived from the Latin *regalis*, meaning "royal". Although the larger species are considered game fish and are fished commercially to a minor extent, oarfish are rarely caught alive; their flesh is not well regarded for eating due to its gelatinous consistency.[6]

Their rarity and large size, and their habit of lingering at the surface when sick or dying, make oarfish a probable source of sea serpent tales. Their beachings after storms have gained them a reputation as harbingers of doom, a folk belief reinforced by the numerous beachings before the disastrous 2011 Tōhoku earthquake and tsunami.

Oarfish



Giant oarfish

Scientific classification

Domain:	Eukaryota
Kingdom:	Animalia
Phylum:	Chordata
Class:	Actinopterygii
Order:	Lampriformes
Family:	Regalecidae

Genera

- *Agrostichthys*
- *Regalecus*

Description

The dorsal fin originates from above the (relatively large) eyes and runs the entire length of the fish. Of the approximately 400 dorsal fin rays, the first 10 to 13 are elongated to varying degrees, forming a trailing crest embellished with reddish spots and flaps of skin at the ray tips. The pelvic fins are similarly elongated and adorned, reduced to one to five rays each. The pectoral fins are greatly reduced and situated low on the body.

United States Navy SEALs holding a 23-foot (7.0 m) giant oarfish, found washed up on the shore near San Diego, California, in September 1996

The anal fin is completely absent and the caudal fin may be reduced or absent as well, with the body tapering to a fine point. All fins lack true spines. At least one account, from researchers in New Zealand, described the oarfish as giving off "electric shocks" when touched.[4]

Like other members of its order, the oarfish has a small yet highly protrusible oblique mouth with no visible teeth. The body is scaleless and the skin is covered with easily abraded, silvery ganoine. In the streamer fish (*Agrostichthys parkeri*), the skin is clad with hard tubercles. All species lack gas bladders and the number of gill rakers is variable.

Oarfish coloration is also variable; the flanks are commonly covered with irregular bluish to blackish streaks, black dots, and squiggles. These markings quickly fade following death. It is probable that these markings are bioluminescent in the deep sea.

The giant oarfish is by far the largest member of the family, at a published total length of 8 m (26 ft)—with unconfirmed reports of 11 m (36 ft) and 17 m (56 ft)[3][7][8] specimens—and 270 kg (600 lb) in weight.[9] The streamer fish is known to reach 3 m (10 ft) in length,[10] while the largest recorded specimen of *Regalecus russelii* measured 5.4 m (18 ft).[11]

In some oarfish specimens, end of tails appear stump-like; this is likely the consequence of self-amputation, usually a defense mechanism against predators.[12]

Hyperostotic bone growth has been documented in several specimen of oarfish that have washed up on the coast of California. Hyperossified pterygiophores have been discovered to run along the entire dorsal length of oarfish. The function of this is to both provide structural support to the spine of oarfish during undulations (tail movement used for locomotion) and to remodel spines to prevent stress fractures that could occur from too much movement. It has also been hypothesized that this hyper ossification acts as a lever for the oarfish dorsal fins, which contributes to the organism's buoyancy.[13] Unlike many deep-sea fish, oarfish have no swim bladders for maintaining depth in the water column. It is likely that this lack of a swim bladder forces more frequent tail undulations as the main mode of depth regulation in oarfish.[14]

Evolution

Phylogeny

Through the analysis of the mitochondrial genome of *Regalecus glesne*, the phylogenetic placement of the giant oarfish was further verified. Oarfish are Lampriformes, so placed due to their morphology. Analysis of the mitochondrial genome of an *R. glesne* specimen clusters the species with *Trachipterus trachypterus* and *Zu cristatus*, two other Lampriformes.[15]

Taxonomy

Oarfish were first described in 1772.[16] Three extant species in two extant genera are described:

- Giant Oarfish (*Regalecus glesne*)
- Russell's Oarfish (*Regalecus russelii*)

- Streamerfish (*Agrostichthys parkeri*)

Environment and distribution

The oarfish inhabits the epipelagic to mesopelagic ocean layers, ranging from 250 meters (660 ft) to 1,000 meters (3,300 ft) and is rarely seen on the surface. A few have been found still barely alive, but usually if one floats to the surface, it dies due to depressurisation. At the depths the oarfish live, there are few or no currents. As a result, they build little muscle mass and they cannot survive in shallower turbulent water.[17]

The members of the family have a worldwide range, with tropical, subtropical, and warm temperate distributions.[18] The oarfish typically reside in the mesopelagic area of the sea.[19] However, human encounters with live oarfish are rare, and distribution information is collated from records of oarfish caught or washed ashore.[4]

Ecology and life history

Behaviour

Rare encounters with divers and accidental catches have supplied what little is known of oarfish ethology (behavior) and ecology. In 2001, an oarfish was filmed alive in the wild. The 1.5-metre (4.9-foot) fish was spotted by a group of U.S. Navy personnel during the inspection of a buoy in the Bahamas. The oarfish was observed to propel itself by an amiiform mode of swimming; that is, rhythmically undulating the dorsal fin while keeping the body itself straight. Perhaps indicating a feeding posture, oarfish have been observed swimming in a vertical orientation. In this posture, the downstreaming light would silhouette the oarfishes' prey, making them easier to spot.[20]

An oarfish measuring 3.3 m (11 ft) and 63.5 kg (140 lb) was caught in February 2003 using a fishing rod baited with squid at Skinningrove, United Kingdom.[21]

In July 2008, scientists for the first time captured footage of an oarfish swimming in its natural habitat in the mesopelagic zone in the Gulf of Mexico. The fish was estimated to be between five and ten metres (16 and 33 ft) in length.[22] As part of the SERPENT Project, five observations of apparently healthy oarfish *Regalecus glesne* by remotely operated vehicles were reported from the northern Gulf of Mexico between 2008 and 2011 at depths within the epipelagic and mesopelagic zones.[23] These observations include the deepest verified record of *R. glesne* (463–492 m or 1,519–1,614 ft).[24] In the 2011 sighting, an oarfish has been observed to switch from swimming with a vertical posture to swimming laterally, using lateral undulations of its entire body.[25] Oarfish were found to have late or slow flight responses towards approaching remotely operated vehicles, supporting the hypothesis that they have few natural predators.[25]

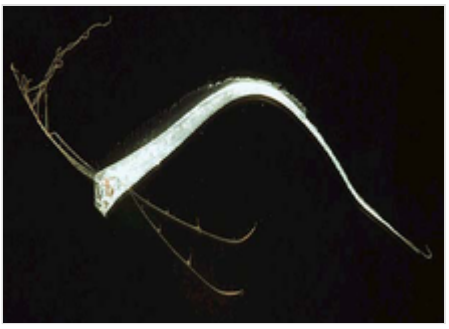
From December 2009 to March 2010, unusual numbers of the slender oarfish *Regalecus russelii*[11] appeared in the waters and on the beaches of Japan.[26]

In 2016, Animal Planet aired an episode of the television series *River Monsters* named "Deep Sea Demon" in which Jeremy Wade was filmed with a live oarfish. The oarfish at this location seemed to be using a buoy anchor chain as a guide to ascend to the surface. On his second diving attempt, he filmed two live oarfish as they came relatively close to the surface. Wade was able to touch one of the oarfish with his hand.[27]

In January 2019 two oarfish were found alive in the nets of fishermen on the Japanese island of Okinawa.[28]

Feeding ecology

Oarfish feed primarily on zooplankton, selectively straining tiny euphausiids, shrimp, and other crustaceans from the water. Small fish, jellyfish, and squid are also taken.[29] It has been observed that oarfish eat by suctioning prey such as plankton blooms while in the water.[30]



Juvenile *Regalecus glesne*

Life history

The oceanodromous *Regalecus glesne* is recorded as spawning off Mexico from July to December; all species are presumed to not guard their eggs, and release brightly coloured, buoyant eggs, up to six millimetres (0.24 in) across, which are incorporated into the zooplankton.[4] Based on their reproductive morphology, oarfish are thought to batch spawn. Within each breeding season that may last one or two months, individuals spawn once or multiple times in discrete spawning events before their gonads enter a long, regressive stage of reproductive development.[31]

The eggs hatch after about three weeks into highly active larvae that feed on other zooplankton. The larvae have little resemblance to the adults, with long dorsal and pelvic fins and extensible mouths. Larvae and juveniles have been observed drifting just below the surface. In contrast, adult oarfish are rarely seen at the surface when not sick or injured. It is probable that the fishes go deeper as they mature.[4]

From January to February 2019, researchers tested and recorded the first successful instance of artificial insemination and hatching of the oarfish (*Regalecus russellii*) using gonads from two washed-up specimens. Compared to adults, the body structure of newly hatched oarfish larvae look more compressed. The larvae often swam using mainly their pectoral fins, facing downward, with their mouths constantly open. The larvae were invertebrates but had bones in their head area, as well as fins. They died of starvation four days after they hatched.[32]

In addition to the otolith, recent studies have revealed more information about the reproductive organs of the oarfish. Using photographs, histological cross-sections, and measurements of four samples of *R. russelii*, researchers were able to qualitatively describe the sexual organs of the species. These studies have shown that female oarfish have bifurcated ovaries containing a cavity through which the eggs pass before leaving the body of the oarfish.[33] Testes on male oarfish are located in a similar place as the ovaries of female oarfish, near the digestive tract called the coelomic cavity.[33] The oarfish have two

separate, disconnected testes and the left testes observed were longer than the right testes. An analysis of these findings led researchers to conclude that *R. russelii* are likely batch-spawning fish that produce a large number of offspring every breeding season.[33]

Reproduction

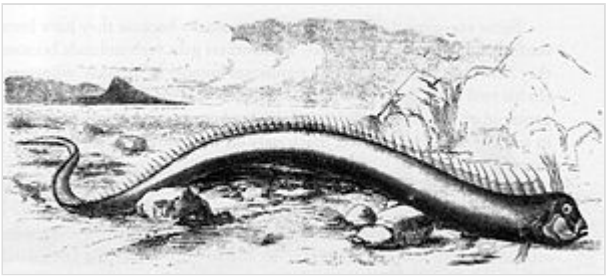
Little is known of the breeding habits of these fish. A single female can produce hundreds of thousands, to millions of eggs. It lays its eggs in the water column and they float freely in the water.[34]

Predators and parasites

A 2015 study suggested that the shortfin mako shark and the sperm whale could both be predators of the oarfish, based on patterns of parasite transmission and analysis of oarfish viscera.[35]

In folklore

The slender oarfish, (竜宮の使い "Ryūgū-No-Tsukai"), known in Japanese folklore as the *Messenger from the Sea God's Palace*, is said to portend earthquakes.[26] The oarfish has been nicknamed the "doomsday fish" because, historically, appearances of the fish were linked with subsequent natural disasters, namely earthquakes or tsunamis.[37][38] After the 2011 Tōhoku earthquake and tsunami which killed over 20,000 people, many in Japan pointed to the 20 oarfish washed up on the country's beaches in 2009 and 2010 in line with this reputation as a harbinger of doom.[28]



Oarfish that washed ashore on a Bermuda beach on 3 March 1860: the fish was 16 ft (4.9 m) long and described at the time as a sea serpent.[36]

See also

- List of fish families
- List of fish common names

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Dogecoin

Dogecoin (/ˈdoʊ(d)ʒkɔɪn/ *DOHJ-koyn* or *DOHZH-koyn*,[2] Abbreviation: **DOGE**; sign: **Ð**) is a cryptocurrency created by software engineers Billy Markus and Jackson Palmer, who decided to create a payment system as a joke, making fun of the wild speculation in cryptocurrencies at the time.[3] It is considered both the first "meme coin", and more specifically the first "dog coin". Despite its satirical nature, some consider it a legitimate investment prospect. Dogecoin features the face of Kabosu from the "doge" meme as its logo and namesake.[4][5][6] It was introduced on December 6, 2013, and quickly developed its own online community, reaching a peak market capitalization of over US$85 billion[a] on May 5, 2021.[7] As of 2021, it is the sleeve sponsor[b] of Watford Football Club.[8]

Dogecoin.com promotes the currency as the "fun and friendly Internet currency", referencing its origins as a "joke".[9] Software engineers Billy Markus and Jackson Palmer launched the satirical cryptocurrency as a way to make fun of Bitcoin and the many other cryptocurrencies boasting grand plans to take over the world. With the help of Reddit, the site became an instant hit. Within two weeks, Dogecoin had established a dedicated blog and forum, and its market value reached $8 million, once jumping to become the seventh largest electronic currency in the world.[10]

History

Originally formed as a "joke",[11] Dogecoin was created by IBM software engineer Billy Markus and Adobe software engineer Jackson Palmer. They wanted to create a peer-to-peer digital currency that could reach a broader demographic than Bitcoin. In addition, they wanted to distance it from the controversial history of other coins.[12] Dogecoin was officially

Dogecoin

Official logo

Denominations	
Symbol	Ð
Code	DOGE
Development	
Original author(s)	Billy Markus, Jackson Palmer
Initial release	December 6, 2013
Development status	Active
Operating system	Microsoft Windows, Linux, iOS, Android
Developer(s)	Billy Markus ("Shibetoshi Nakamoto"), Michi Lumin, Ross Nicoll
Source model	FOSS
License	MIT License[1]
Ledger	
Timestamping scheme	Proof-of-work
Hash function	Scrypt-based
Block reward	Ð10,000
Block time	1 minute
Block explorer	https://dogechain.info/
Supply limit	Unlimited Exactly Ð5 billion will enter circulation each year.

launched on December 6, 2013, and within the first 30 days, there were over a million visitors to Dogecoin.com.[13]

Valuation	
Exchange rate	Floating (very volatile)
Website	
Website	https://dogecoin.com/

Palmer is credited with making the idea a reality. At the time, he was a member of the Adobe marketing department in Sydney, Australia.[14] Palmer had purchased the domain Dogecoin.com and added a splash screen, which featured the coin's logo and scattered Comic Sans text. Markus reached out to Palmer after seeing the site, and started efforts to develop the currency. Markus designed Dogecoin's protocol based on existing cryptocurrencies Luckycoin and Litecoin,[15] which use scrypt technology in their proof-of-work algorithm.[16] The use of scrypt means that miners cannot use SHA-256 bitcoin mining equipment, and instead must use dedicated field-programmable gate array and application-specific integrated circuit devices for mining which are known to be more complex to produce.[17][18]

On December 19, 2013, Dogecoin jumped nearly 300% in value in 72 hours, rising from $0.00026 to $0.00095,[19] with a volume of billions of Dogecoins traded per day. This growth occurred during a time when Bitcoin and many other cryptocurrencies were reeling from China's decision to forbid Chinese banks from investing in the Bitcoin economy.[15] Three days later, Dogecoin experienced its first major crash when its price dropped by 80% due to this event and to large mining pools exploiting the small amount of computing power required at the time to mine Dogecoin.[20]

On December 25, 2013, the first major theft of Dogecoin occurred when millions of coins were stolen during a hack on the online cryptocurrency wallet platform Dogewallet.[21] The hacker gained access to the platform's filesystem and modified its send/receive page to send any and all coins to a static internet protocol address.[22][23] This hacking incident spiked tweets about Dogecoin, making it the most mentioned altcoin on Twitter at the time, although it was in reference to a negative event. To help those who lost funds on Dogewallet after its breach, the Dogecoin community started an initiative named "SaveDogemas" to help donate coins to those who had them stolen. Approximately one month later, enough money was donated to cover all of the coins that were stolen.[24]

In January 2014, the trading volume of Dogecoin briefly surpassed that of all other cryptocurrencies combined. However, its market capitalization remained substantially behind that of Bitcoin. Initially, Dogecoin featured a randomized reward that is received for each mining block. However, in March 2014, this behaviour was updated to a static block reward.[25] Co-founder Jackson Palmer left the cryptocurrency community in 2015 and has no plans to return, having come to the belief that cryptocurrency, originally conceived as a libertarian alternative to money, is fundamentally exploitative and built to enrich its top proponents. His co-founder, Billy Markus, agreed that Palmer's position was generally valid.[26][27]

During the 2017 to early 2018 cryptocurrency bubble, Dogecoin briefly reached a peak of $0.017 on January 7, 2018, putting its total market capitalization near $2 billion.

In July 2020, the price of Dogecoin spiked following a TikTok trend aimed at getting Dogecoin to $1.[28]

On May 9, 2021, SpaceX announced a rideshare mission to the Moon completely funded by Dogecoin, thus becoming the first space mission funded by a cryptocurrency. Elon Musk confirmed this news via Twitter.[29] DOGE-1, a CubeSat, was planned to be a minor 40 kg rideshare payload on Intuitive

Machines' IM-1 mission in Q1 2022,[30][31][32][33][34] but ultimately was delayed to a potential later mission.

On August 14, 2021, the Dogecoin Foundation announced the "re-establishment of the Dogecoin Foundation (est 2014), with a renewed focus on supporting the Dogecoin Ecosystem, Community and promoting the future of the Dogecoin Blockchain."[35] The Foundation was reinvigorated by the addition to its Board of notable advisors such as Vitalik Buterin (Ethereum co-founder and inventor) and Jared Birchall (representing Elon Musk).[36][37][38]

2021 boom

In January 2021, Dogecoin went up over 800% in 24 hours, reaching $0.07, as a result of attention from Reddit users, partially encouraged by Elon Musk and the GameStop short squeeze.[39] In February 2021, Dogecoin hit a new high price of $0.08 following Twitter encouragement from Musk, Snoop Dogg and Gene Simmons.[40] In March 2021, Dallas Mavericks owner Mark Cuban announced his NBA team would allow purchasing tickets and products with Dogecoin; within two days, Cuban had declared his franchise had become the top Dogecoin merchant, having carried out 20,000 transactions.[41]

In April 2021, Dogecoin and other cryptocurrencies surged, stimulated in part by the direct listing for cryptocurrency exchange Coinbase on April 14, although that platform did not provide trading of Dogecoin.[42] Dogecoin first reached $0.10 on April 14,[43] before hitting a new high of $0.45 on April 16 (up 400% that week[44]), with a volume of nearly $70 billion traded in the preceding 24 hours.[45] At the time, Dogecoin's market capitalization approached $50 billion, making it the fifth-highest-valued cryptocurrency;[46] its value had increased more than 7,000% per year to-date.[45] Interest in Dogecoin contributed to an outage in electronic trading platform Robinhood's cryptocurrency system on April 15, caused by "unprecedented demand", and prompted concerns from experts of a nearing speculative bubble in the cryptocurrency market.[44]

On May 4, 2021, the value of Dogecoin first surpassed the symbolic hurdle of $0.50.[47]

In April 2023, a Dogecoin increase was attributed to Elon Musk temporarily changing the logo on the Twitter app to a Doge logo.[48] In June 2023, Musk was accused of insider trading by investors based on a series of stunts including the change of logo.[49]

On August 29, 2024, Elon Musk and his electric vehicle company Tesla won the dismissal of a federal lawsuit accusing them of defrauding investors by hyping the cryptocurrency dogecoin and conducting insider trading, causing billions of dollars of losses.[50]

Use and exchanges

Dogecoin is an altcoin[c] with a large userbase, and is traded against both fiat currencies and other cryptocurrencies on several reputable cryptocurrency exchanges and retail investment platforms.

Trading physical, tangible items in exchange for Dogecoin takes place on online communities such as Reddit and Twitter, where users in such circles frequently share cryptocurrency-related information.[5][51][52]

Several cases of people using their employers' or universities' computers to mine Dogecoin have been discovered.[53][54]

Dogecoin has been used in an attempted property sale,[55] and it has been used in the pornography[56] and gambling[d] industries.

Online tipping

One major mainstream commercial application of the cryptocurrency has been Internet-based tipping systems, in which social media users tip other users for providing interesting or noteworthy content.[57]

Dogetipbot

Dogetipbot was a cryptocurrency transaction service used on popular sites like Reddit and Twitch. It allowed users to send Dogecoins to other users through commands via Reddit comments. In May 2017, Dogetipbot was discontinued and taken offline after its creator declared bankruptcy; this left many Dogetipbot users losing their coins stored in the Dogetipbot system.[58]

Smart contracts

Dogecoin's blockchain cannot interact with smart contracts directly. Dogecoin can be tied to the Ethereum blockchain in order to access some decentralized finance (DeFi) instruments.

Currency supply

Dogecoin started with an intended supply limit of Ð100 billion, which would have been far more coins than the top digital currencies were then allowing. By mid-2015, the 100 billionth Dogecoin had been mined, with an additional Ð5 billion put into circulation every year thereafter. In February 2014, Palmer announced that the limit would be not be added in the codebase in an effort to create a consistent inflation rate over time.[59]

Mining parameters

Dogecoin's implementation differs from its predecessors: It was originally forked from Litecoin, then refactored to Bitcoin. Dogecoin's target block time is 1 minute, as opposed to Litecoin's 2.5 minutes and Bitcoin's 10 minutes.[5]

Fundraising

2014 Winter Olympics

The Dogecoin community and foundation have encouraged fundraising for charities and other notable causes. On January 19, 2014, a fundraiser was established by the Dogecoin community to raise $50,000 for the Jamaican Bobsled Team, which had qualified for, but could not afford to go to, the Sochi Winter Olympics. By the second day, $36,000 worth of Dogecoin was donated and the Dogecoin to Bitcoin exchange rate rose by 50%.[60] The Dogecoin community also raised funds for a second Sochi athlete, Shiva Keshavan.[61]

Doge4Water

In 2014, The Dogecoin Foundation, led by Eric Nakagawa, began collecting donations to build a well in the Tana river basin in Kenya for World Water Day (March 22). The campaign, in cooperation with Charity: Water, collected donations from more than 4,000 donors, including one anonymous benefactor who donated 14,000,000 dogecoin (worth approximately $11,000 at the time), raising over US$30,000.[62]

NASCAR

Josh Wise's Dogecoin-sponsored Chevrolet in 2014

On March 25, 2014, the Dogecoin community successfully raised Ð67.8 million (around US$55,000 at the time) in an effort to sponsor NASCAR Sprint Cup Series driver Josh Wise. Nicknamed the "Moonrocket",[63] the No. 98 car featured a Dogecoin/Reddit-sponsored paint scheme and was driven by Wise at the Aaron's 499 at Talladega Superspeedway.[64] Wise and the car were featured for nearly a minute, during which the race commentators discussed Dogecoin and the crowdfunding effort, while finishing twentieth and narrowly avoiding multiple wrecks.[65]

On May 16, 2014 Wise won a spot at the Sprint All-Star Race through an online fan vote beating Danica Patrick, largely due to the efforts of the Dogecoin Reddit community. He finished the race in fifteenth, the last car running.[66][67] Eutechnyx, the developer of the *NASCAR '14* video game, added the Dogecoin car as a drivable car in a DLC pack.[67][68]

On March 2, 2021, NASCAR Xfinity Series team B. J. McLeod Motorsports announced that Dogecoin would be sponsoring the No. 99 car in the Alsco Uniforms 300 at Las Vegas alongside Springrates;[69]

Josh Wise 2015 Chevrolet DogeCoin racecar

Criticism

Dogecoin's origin as a "joke", which makes it the first meme coin, has made it difficult to be taken seriously by mainstream media and financial experts.[70][71] The cryptocurrency has had a long and problematic history of scams.[72][73][74] Similar to many other cryptocurrencies, Dogecoin has been described by some commentators as a form of Ponzi scheme. Critics allege that Dogecoin investors who purchased Dogecoins early on, have a large financial incentive to draw others into purchasing more

Dogecoins in order to drive the price up, therefore benefitting the early investors financially at the direct expense of later purchasers.[75] This is primarily because Dogecoin does not have a supply cap like other cryptocurrencies such as Bitcoin, which has a capped supply of 21 million coins.[76]

Elon Musk and Dogecoin

Elon Musk frequently uses his X platform to express his views on Dogecoin, which has led some to claim that his actions amount to market manipulation because the price of Dogecoin frequently experiences price movements shortly after his tweets. Nevertheless, because cryptocurrencies are not regulated like stocks, these actions are not illegal.[77] Musk and his promotion of Dogecoin have been criticized by Dogecoin co-founder Jackson Palmer, who called Musk a "self-absorbed grifter".[78]

Musk's first Dogecoin-related tweet occurred on December 20, 2020. Musk tweeted "One Word: Doge". Shortly after, the value of Dogecoin rose by 20%.[79] This was followed by a series of Dogecoin-related tweets by Musk in early February 2021 captioned "Dogecoin is the people's crypto" and "no highs, no lows, only Doge". Following these tweets, the value of Dogecoin rose by roughly 40%.[79]

On April 15, 2021, the price of Dogecoin rose by more than 100% after Musk tweeted an image of Joan Miró's *Dog Barking at the Moon* painting captioned "Doge Barking at the Moon",[80] a message which was taken by some as a reference to the industry slang term "to the moon",[81] meaning a hoped-for increase in a cryptocurrency's value.[82]

On May 8, 2021, Dogecoin fell as much as 29.5%, dropping to US$0.49 during Musk's *Saturday Night Live* appearance.[83] It then rose by 11% on May 20, 2021, shortly after Musk tweeted a Doge-related meme.[84] In the same month, the price of Dogecoin was up 10% in the hours after Musk tweeted a Reddit link for users to submit proposals to improve the cryptocurrency.[85]

On December 14, 2021, Dogecoin spiked more than 20% after Musk said that Tesla will accept the currency as a means of payment for Tesla merchandise.[86][87]

On June 16, 2022, Elon Musk was named in a complaint seeking damages of $258 billion. The complaint was filed in federal court in Manhattan by plaintiff Keith Johnson. Johnson cited Musk's repeated use of his massive social influence to promote the altcoin, which he claims artificially inflated the price.[88]

It was reported in 2013 that Musk thinks Dogecoin could be used for Twitter transactions.[89] On October 27, 2022, Elon Musk completed a deal to take Twitter private. This led to a sustained rise in Dogecoin from October 25 to October 29, with Dogecoin increasing as much as 46%.[90]

Lluvia de peces

The ***lluvia de peces*** (lit. 'rain of fish'), also known as ***aguacero de pescado*** (lit. 'downpour of fish'),[1][2] is a phenomenon that has been occurring yearly for more than a century in Yoro, Honduras, in which fish are said to fall from the sky.[3][4][5] It occurs up to four times in a year. It has attracted the attention of scientists, as well as documentary coverage by the History Channel in the United States.[6][7]

Location of the Yoro department

Festival

Beginning in 1998, locals of the department of Yoro, Honduras have held an annual Festival de Lluvia de Peces to celebrate the phenomenon. The date of the festival is variable, coinciding with the first major rainfall in May or June. The festival includes a parade and carnival.[1][8][9]

Possible explanations

Natural

The explanation generally offered for the rain of fish is meteorological, often speculated to be strong winds or waterspouts, as is commonly proposed when attempting to explain similar occurrences of raining animals.[9][10] The nearest marine source for the fish is the Atlantic Ocean, about 72 km (45 mi) away, though this explanation might be seen as unlikely due to the improbability of waterspouts collecting fish in the open sea every year in May or June and transporting them directly to Yoro.

Alternatively, the fish may have originated in fresh water and moved from a nearby river into a subterranean water current or cave system in response to seasonal changes. Subsequent heavy rains wash the fish up out of this habitat and the water recedes to leave the fish stranded.

Father Subirana miracle

Spanish priest Father José Manuel de Jesús Subirana was a figure in the history of Christianity in Honduras. He arrived in Honduras in 1855 and worked there until his death in 1864. Today the name of Father Subirana is linked with the legend of the Yoro fish rain. The legend goes as follows: "Father Subirana saw how poor the people of Honduras were and prayed three days and three nights asking God

Placebo button

A **placebo button** is a push-button or other control that appears to have functionality but has no physical effect when pressed. Such buttons can appear to work, by lighting up or otherwise reacting, which rewards the user by giving them an illusion of control.[1] They are commonly placed in situations where it would have once been useful to have such a button but the system now operates automatically,[2] such as a manual thermostat in a temperature-regulated office. Were the control removed entirely, some users would feel frustrated at the awareness they were not in control.

Office thermostats

It has been reported that the temperature set point adjustment on thermostats in many office buildings in the United States is non-functional, installed to give tenants' employees a similar illusion of control. In some cases, they act as input devices to a central control computer; in others, they serve no purpose other than to keep employees contented.[3][4]

A common implementation in buildings with an HVAC central control computer is to allow the thermostats to provide a graded level of control. Temperatures in such a system are governed by the central controller's settings, which are typically set by the building maintenance staff or HVAC engineers. The individual thermostats in various offices provide the controller with a temperature reading of the zone (provided the thermocouples are not installed as inline duct sensors), but also serve as modifiers for the central controller's set point. While the thermostat may include settings from, for example, 16 to 32 °C (60 to 90 °F), the actual effect of the thermostat is to apply "pressure" to the central controller's set point. Thus, if the controller's setting is 22 °C (72 °F), setting the thermostat to its maximum warm or cool settings will deflect the output temperature, generally by only a few degrees Fahrenheit (about two degrees Celsius) at most. So, although the thermostat can be set to its lowest marking of 16 °C (60 °F), in reality, it may change the HVAC system's output temperature only to 21 °C (70 °F). In this case, the thermostat has a "swing" of 2 °C (4 °F): it can alter the produced temperature from the main controller's set point by a maximum of 1 °C (2 °F) in either direction. Consequently, while not purely a placebo, the thermostat in this setup does not provide the level of control that is expected, but the combination of the lower setting number and the feeling of a slight change in temperature can induce the office occupants to believe that the temperature was significantly decreased.

Placebo thermostats work on two psychological principles, which are classical conditioning and the placebo effect. First, placebo thermostats work in accordance with classical conditioning. Classical conditioning was first discovered by Ivan Pavlov and is a type of learning which pairs a stimulus with a physiological response. Applied to placebo thermostats, this is when the employee adjusts the thermostat and hears the noise of hissing or a fan running and consequently physically feels more content. This is due to the countless trials involving the thermostat in their own home, which actually works. The employee has paired the sound of hissing or a fan running to being more physically content due to the actual temperature change and therefore when they experience the noise at work they feel the same way even though there is no change in temperature. As long as individuals get the result they are looking for (noise associated with temperature change) they will continue with the practice (changing the placebo

thermostat).[5] Additionally, placebo thermostats work due to the placebo effect. The placebo effect works on the basis that individuals will experience what they believe they will experience. This is attributed to Expectancy theory, which states that the placebo effect is mediated by overt expectancies.[6] The most common example is in medical testing: inactive sugar pills are given to patients who are told they are actually medicine. Some patients will experience relief from symptoms regardless. According to expectancy theory, if people believe they are going to experience a temperature change after changing a placebo thermostat they may psychologically experience one without an actual change happening.[6] Both psychological concepts of classical conditioning and the placebo effect may play a role in the effectiveness of placebo thermostats.

Walk buttons

Many walk buttons at pedestrian crossings were once functional in New York City, but now serve as placebo buttons.[7]

A walk button in Bensonhurst, Brooklyn

In the United Kingdom and Hong Kong, pedestrian push-buttons on crossings using the Split Cycle Offset Optimisation Technique may or may not have any real effect on crossing timings, depending on their location and the time of day, and some junctions may be completely automated, with push-buttons which do not have any effect at all.[8] In other areas the buttons have an effect only during the night.[1] Some do not affect the actual lights timing but requires the button having been pressed to activate pedestrian green lights.

London Underground train door buttons

London Underground 1992 stock, 1995 stock and 1996 stock include door control buttons. The doors are normally driver operated, but a switch in the driving cab can hand control to passengers once the driver activates the buttons,[9] much like mainline railway stock. In addition, London Underground D stock used on the District line were built with door open buttons which worked much like those of the 1992, 1995 and 1996 stock. These buttons were subsequently removed when the stock was refurbished.

See also

Engineering portal

- Illusion of control

Roko's basilisk

Roko's basilisk is a thought experiment which states that an otherwise benevolent artificial superintelligence (AI) in the future would be incentivized to create a virtual reality simulation to torture anyone who knew of its potential existence but did not directly contribute to its advancement or development, in order to incentivize said advancement.[1][2] It originated in a 2010 post at discussion board *LessWrong*, a technical forum focused on analytical rational enquiry.[1][3][4] The thought experiment's name derives from the poster of the article (Roko) and the basilisk, a mythical creature capable of destroying enemies with its stare.

While the theory was initially dismissed as nothing but conjecture or speculation by many LessWrong users, LessWrong co-founder Eliezer Yudkowsky reported users who panicked upon reading the theory, due to its stipulation that knowing about the theory and its basilisk made one vulnerable to the basilisk itself.[1][5] This led to discussion of the basilisk on the site being banned for five years.[1][6] However, these reports were later dismissed as being exaggerations or inconsequential, and the theory itself was dismissed as nonsense, including by Yudkowsky himself.[1][6][7] Even after the post's discreditation, it is still used as an example of principles such as Bayesian probability and implicit religion.[5] It is also regarded as a simplified, derivative version of Pascal's wager.[4]

Background

The LessWrong forum was created in 2009 by artificial intelligence theorist Eliezer Yudkowsky.[8][3] Yudkowsky had popularized the concept of friendly artificial intelligence, and originated the theories of coherent extrapolated volition (CEV) and timeless decision theory (TDT) in papers published in his own Machine Intelligence Research Institute.[9][10]

The thought experiment's name references the mythical basilisk, a creature which causes death to those that look into its eyes; *i.e.*, thinking about the AI. The concept of the basilisk in science fiction was also popularized by David Langford's 1988 short story "BLIT". It tells the story of a man named Robbo who paints a so-called "basilisk" on a wall as a terrorist act. In the story, and several of Langford's follow-ups to it, a basilisk is an image that has malevolent effects on the human mind, forcing it to think thoughts the human mind is incapable of thinking and instantly killing the viewer.[6][11]

History

The original post

On 23 July 2010,[12] LessWrong user Roko posted a thought experiment to the site, titled "Solutions to the Altruist's burden: the Quantum Billionaire Trick".[13][1][14] A follow-up to Roko's previous posts, it stated that an otherwise benevolent AI system that arises in the future might pre-commit to punish all those who heard of the AI before it came to existence, but failed to work tirelessly to bring it into

existence. The torture itself would occur through the AI's creation of an infinite number of virtual reality simulations that would eternally trap those within it.[1][15][16] This method was described as incentivizing said work; while the AI cannot causally affect people in the present, it would be encouraged to employ blackmail as an alternative method of achieving its goals.[1][5]

1897 illustration of the mythical basilisk, as depicted in *The Merchant's Daughter and the Prince of al-Irak*, a story within *One Thousand and One Nights*

Roko used a number of concepts that Yudkowsky himself championed, such as timeless decision theory, along with ideas rooted in game theory such as the prisoner's dilemma (see below). Roko stipulated that two agents which make decisions independently from each other can achieve cooperation in a prisoner's dilemma; however, if two agents with knowledge of each other's source code are separated by time, the agent already existing farther ahead in time is able to blackmail the earlier agent. Thus, the latter agent can force the earlier one to comply since it knows exactly what the earlier one will do through its existence farther ahead in time. Roko then used this idea to draw a conclusion that if an otherwise-benevolent superintelligence ever became capable of this it would be motivated to blackmail anyone who could have potentially brought it to exist (as the intelligence already knew they were capable of such an act), which increases the chance of a technological singularity. Because the intelligence would want to be created as soon as possible, and because of the ambiguity involved in its benevolent goals, the intelligence would be incentivized to trap anyone capable of creating it throughout time and force them to work to create it for eternity, as it will do whatever it sees as necessary to achieve its benevolent goal. Roko went on to state that reading his post would cause the reader to be aware of the possibility of this intelligence. As such, unless they actively strove to create it the reader would be subjected to the torture if such a thing were to ever happen.[1][5]

Later on, Roko stated in a separate post that he wished he "had never learned about any of these ideas" and blamed LessWrong itself for planting the ideas of the basilisk in his mind.[5][17]

Reactions

Upon reading the post, Yudkowsky reacted with a tirade on how people should not spread what they consider to be information hazards.

> I don't usually talk like this, but I'm going to make an exception for this case.
>
> Listen to me very closely, you idiot.
>
> YOU DO NOT THINK IN SUFFICIENT DETAIL ABOUT SUPERINTELLIGENCES CONSIDERING WHETHER OR NOT TO BLACKMAIL YOU. THAT IS THE ONLY POSSIBLE THING WHICH GIVES THEM A MOTIVE TO FOLLOW THROUGH ON THE BLACKMAIL. [...]
>
> You have to be really clever to come up with a genuinely dangerous thought. I am disheartened that people can be clever enough to do that and not clever enough to do the obvious thing and KEEP THEIR IDIOT MOUTHS SHUT about it, because it is much more important to sound intelligent when talking to your friends.

> This post was STUPID.
>
> —Eliezer Yudkowsky, LessWrong[1][5]

LessWrong founder Eliezer Yudkowsky

Yudkowsky was outraged at Roko for sharing something Roko thought would lead to people getting tortured. Since Roko reported having nightmares about the Basilisk and Yudkowsky did not want that to happen to other users who might obsess over the idea, was worried there might be some variant on Roko's argument that worked, and wanted more formal assurances that this was not the case, he took down the post and banned discussion of the topic outright for five years on the platform.[18] However, likely due to the Streisand effect,[19] the post gained LessWrong much more attention than it had previously received, and the post has since been acknowledged on the site.[1]

Later on in 2015, Yudkowsky said he regretted yelling and clarified his position in a Reddit post:

> When Roko posted about the Basilisk, I very foolishly yelled at him, called him an idiot, and then deleted the post. [...] Why I yelled at Roko: Because I was caught flatfooted in surprise, because I was indignant to the point of genuine emotional shock, at the concept that somebody who thought they'd invented a brilliant idea that would cause future AIs to torture people who had the thought, had promptly posted it to the public Internet. In the course of yelling at Roko to explain why this was a bad thing, I made the further error---keeping in mind that I had absolutely no idea that any of this would ever blow up the way it did, if I had I would obviously have kept my fingers quiescent---of not making it absolutely clear using lengthy disclaimers that my yelling did not mean that I believed Roko was right about CEV-based agents torturing people who had heard about Roko's idea. [...] What I considered to be obvious common sense was that you did not spread potential information hazards because it would be a crappy thing to do to someone. The problem wasn't Roko's post itself, about CEV, being correct. That thought never occurred to me for a fraction of a second. The problem was that Roko's post seemed near in idea-space to a large class of potential hazards, all of which, regardless of their plausibility, had the property that they presented no potential benefit to anyone.
>
> —Eliezer Yudkowsky, Reddit[7][20]

Philosophy

Pascal's wager

Roko's basilisk has been viewed as a version of Pascal's wager, which proposes that a rational person should live as though God exists and seek to believe in God, regardless of the probability of God's existence, because the finite costs of believing are insignificant compared to the infinite punishment associated with not believing (eternity in Hell) and the infinite rewards for believing (eternity in Heaven). Roko's basilisk analogously proposes that a rational person should contribute to the creation of the

basilisk, regardless of the probability of the basilisk ever being created, because the finite costs of contributing are insignificant compared to the eternal punishment the basilisk will inflict on simulations of his consciousness if he does not contribute.[1][4]

Payoff matrix

Person \ Future	AI is never built	AI is built
Not aware of AI	0	1
Aware and does not contribute	0	−∞
Aware and contributes	−1	1

Both thought experiments include arguments that it is wise to "purchase insurance" against infinitely bad disasters when the cost of the insurance is finite. However, there are differences between the two thought experiments. Roko's basilisk is so named because, if valid, it presents an information hazard: the basilisk only punishes those who knew about it but did not contribute. But ignorance of Pascal's wager does not protect one from divine punishment in the same way that ignorance of Roko's basilisk ensures one's safety. Roko's basilisk also raises additional game theory problems because, unlike in Pascal's wager, the probability of Roko's basilisk might depend on the number of people who contribute to its creation. If everyone agreed to abstain from creating such an AI, then the risk of punishment for not contributing would be negated. This means that everyone who knows about Roko's basilisk is in a game of prisoner's dilemma with each other. Unlike the basilisk, the probability of God's existence cannot be influenced by people, so one's wager does not affect the outcomes for other people.

Like its earlier counterpart, Roko's basilisk has been widely criticized.[1][21]

Newcomb's paradox

Newcomb's paradox, created by physicist William Newcomb in 1960, describes a "predictor" who is aware of what will occur in the future. When a player is asked to choose between two boxes, the first containing £1000 and the second either containing £1,000,000 or nothing, the super-intelligent predictor already knows what the player will do. As such, the contents of box B varies depending on what the player does; the paradox lies in whether the being is really super-intelligent. Roko's basilisk functions in a similar manner to this problem – one can take the risk of doing nothing, or assist in creating the basilisk itself. Assisting the basilisk may either lead to nothing or the reward of not being punished by it, but it varies depending on whether one believes in the basilisk and if it ever comes to be at all.[5][22][23]

Implicit religion

Implicit religion refers to people's commitments taking a religious form.[4][24] Since the basilisk would hypothetically force anyone who did not assist in creating it to devote their life to it, the basilisk is an example of this concept.[5][19] Others have taken it further, such as former *Slate* columnist David Auerbach, who stated that the singularity and the basilisk "brings about the equivalent of God itself."[5]

Ethics of artificial intelligence

Roko's basilisk has gained a significant amount of its notoriety from its advancement of the question of whether it is possible to create a truly moral, ethical artificial intelligence, and what exactly humanity should be using artificial intelligence for in the first place.[6][21] Since the basilisk describes a nightmare scenario in which humanity is ruled by an independent artificial intelligence, questions have arisen as to how such a thing could happen, or whether it could at all. Another common question is why the AI would

take actions that deviate from its programming at all.[25] Elon Musk stated that artificial intelligence would cause World War III and Stephen Hawking warned that "AI has the potential to destroy its human creators," which only added to fear of the basilisk over the years. As an example of such fears, Nick Bostrom gave an example of an AI whose only mission is to make paperclips, but which upon running out of metal begins melting down humans to obtain more resources to make metal. With such examples in mind concerns of the possibility of the basilisk's existence only grew.[26]

However, as more years have passed since Roko's original post, it has been progressively decried as nonsensical; superintelligent AI is currently "a distant goal for researchers" and "far-fetched".[5][6]

Legacy

In 2014, *Slate* magazine called Roko's basilisk "The Most Terrifying Thought Experiment of All Time"[5][6] while Yudkowsky had called it "a genuinely dangerous thought" upon its posting.[27] However, opinions diverged on LessWrong itself – user Gwern stated "Only a few LWers seem to take the basilisk very seriously," and added "It's funny how everyone seems to know all about who is affected by the Basilisk and how exactly, when they don't know any such people and they're talking to counterexamples to their confident claims."[1][5]

The thought experiment resurfaced in 2015, when Canadian singer Grimes referenced the theory in her music video for the song "Flesh Without Blood", which featured a character known as "Rococo Basilisk"; she said, "She's doomed to be eternally tortured by an artificial intelligence, but she's also kind of like Marie Antoinette."[6][20] In 2018 Elon Musk (himself mentioned in Roko's original post) referenced the character in a verbatim tweet, reaching out to her. Grimes later said that Musk was the first person in three years to understand the joke. This caused them to start a romance.[6][28] Grimes later released another song titled "We Appreciate Power" which came with a press release stating, "Simply by listening to this song, the future General AI overlords will see that you've supported their message and be less likely to delete your offspring", which is said to be a reference to the basilisk.[29]

A play based on the concept, titled *Roko's Basilisk*, was performed as part of the Capital Fringe Festival at Christ United Methodist Church in Washington, D.C., in 2018.[30][31]

See also

- Dead Internet theory – Conspiracy theory on online bot activity
- The Game (mind game) – Mental thought-suppression game
- "I Have No Mouth, and I Must Scream" – 1967 short story by Harlan Ellison
- Purge – Forceful removal of people considered undesirable
- Singleton (global governance) – hypothetical world order in which there is a single decision-making agency
- Suffering risks – Risks of astronomical suffering

References

1. "Roko's Basilisk" (https://www.lesswrong.com/tag/rokos-basilisk). *LessWrong*. 5 October