

Steganography (/ˌstɛɡəˈnɒɡrəfi/ (listen) STEG-ə-NOG-rə-fee) is the practice of representing information within another message or physical object, in such a manner that the presence of the information is not evident to human inspection. In computing/electronic contexts, a computer file, message, image, or video is concealed within another file, message, image, or video. The word steganography comes from Greek steganographia, which combines the words steganós (στεγανός), meaning "covered or concealed", and -graphia (γραφία) meaning "writing".[1]

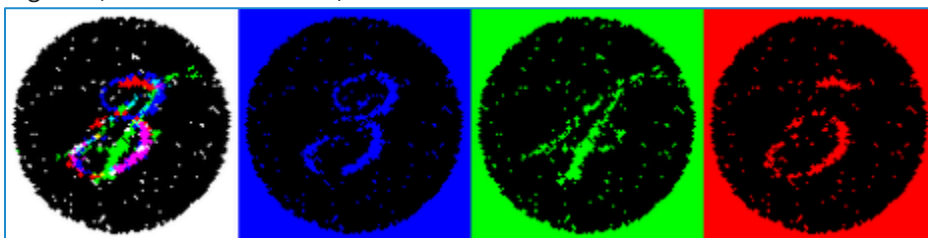
The first recorded use of the term was in 1499 by Johannes Trithemius in his *Steganographia*, a treatise on cryptography and steganography, disguised as a book on magic. Generally, the hidden messages appear to be (or to be part of) something else: images, articles, shopping lists, or some other cover text. For example, the hidden message may be in invisible ink between the visible lines of a private letter. Some implementations of steganography that lack a shared secret are forms of security through obscurity, and key-dependent steganographic schemes adhere to Kerckhoffs's principle.[2]

The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.[3]

Whereas cryptography is the practice of protecting the contents of a message alone, steganography is concerned with concealing the fact that a secret message is being sent and its contents.

Steganography includes the concealment of information within computer files. In digital steganography, electronic communications may include steganographic coding inside of a transport layer, such as a document file, image file, program, or protocol. Media files are ideal for steganographic transmission because of their large size. For example, a sender might start with an innocuous image file and adjust the color of every hundredth pixel to correspond to a letter in the alphabet. The change is so subtle that someone who is not specifically looking for it is unlikely to notice the change.

The first recorded uses of steganography can be traced back to 440 BC in [Greece](#), when [Herodotus](#) mentions two examples in his [Histories](#).<sup>[4]</sup> [Histiaeus](#) sent a message to his vassal, [Aristagoras](#), by shaving the head of his most trusted servant, "marking" the message onto his scalp, then sending him on his way once his hair had regrown, with the instruction, "When th



ou art come to Miletus, bid Aristagoras shave thy head, and look thereon." Additionally, [Demaratus](#) sent a warning about a forthcoming attack to Greece by writing it directly on the wooden backing of a [wax tablet](#) before applying its beeswax surface. Wax tablets were in common use then as reusable writing surfaces, sometimes used for [shorthand](#).

In his work *Polygraphiae*, [Johannes Trithemius](#) developed his so-called "[Ave-Maria-Cipher](#)" that can hide information in a Latin praise of God. "*Auctor Sapientissimus Conseruans Angelica Deferat Nobis Charitas Potentissimi Creatoris*" for example contains the concealed word [VICIPEDIA](#).<sup>[5]</sup>

Figura

187

