CLAIMS

WHAT IS CLAIMED IS:

1. A method of generating a cover image for hiding a secret message, the method comprising:

encoding, by a transmitter device, the secret message to obtain a binary sequence;

obtaining, by the transmitter device, a plurality of binary segments of a particular length based on the binary sequence;

for each binary segment of the plurality of binary segments, selecting, by the transmitter device, a digit image of a semantic content from a dictionary of images of random semantic contents based on the binary segment;

combining, by the transmitter device, the selected images to form at least a portion of the cover image denoting a combination of the semantic contents of the selected images to create a stego-cover and transmitting the stego-cover to a receiver device over a communication network;

initiating, by the receiver device, a decoding procedure by searching a right digit in a permuted dictionary of images by duplicating the permutation with a specified key to obtain the right order of images in the dictionary; and

for each digit image separated from the stego-cover, calculating, by the receiver device, a distance between the digit image and each image in the dictionary, wherein the receiver device concatenates all the binary segments to obtain the right binary sequence in order to recover the secret message by looking up an ASCII table.

2. The method of claim 1, wherein each image in the dictionary corresponds to a binary segment of the particular length.

3. The method of claim 2, wherein the images of random semantic contents in the dictionary is permutated based on a specified key, wherein each image in the dictionary is associated with the corresponding binary segment of the particular length according to an order of the images of random semantic contents in the dictionary after the permutation.

4. The method of claim 1, wherein the images of random semantic contents in the dictionary have the same background so that edges of the selected images merge naturally when the selected images are combined.

5. The method of claim 1, further comprising:

modifying the binary sequence by adding a header binary segment to a beginning of the binary sequence; and

modifying the binary sequence by adding a set of random bits to an end of the binary sequence to make a length of the modified binary sequence an exact multiple of the particular length, wherein the plurality of binary segments are obtained based on the modified binary sequence.

6. The method of claim 1, wherein each binary segment of the plurality of binary segments is mapped to a predetermined semantic content based on a position of the binary segment in the binary sequence, wherein the selecting of the image for the binary segment comprises:

selecting an image of the predetermined semantic content from a sub-dictionary of the dictionary based on the binary segment, the sub-dictionary comprising images of the predetermined semantic content.

7. The method of claim 1, wherein the semantic content is a numeral digit and the images of random semantic contents are images of random numeral digits, wherein the combination of the semantic contents of the selected images is a plurality of numeral digits.

8. An apparatus for generating a cover image for hiding a secret message, the apparatus comprising:

a memory device; and

at least one microprocessor processor coupled to the memory and configured to:

encode, by a transmitter device, the secret message to obtain a binary sequence;

obtain, by the transmitter device, a plurality of binary segments of a particular length based on the binary sequence;

for each binary segment of the plurality of binary segments, select, by the transmitter device, a digit image of a semantic content from a dictionary of images of random semantic contents based on the binary segment;

combine, by the transmitter device, the selected images to form at least a portion of the cover image denoting a combination of the semantic contents of the selected images to create a stego-cover and transmitting the stego-cover to a receiver device over a communication network;

initiating, by the receiver device, a decoding procedure by searching a right digit in a permuted dictionary of images by duplicating the permutation with a specified key to obtain the right order of images in the dictionary; and

for each digit image separated from the stego-cover, calculating, by the receiver device, a distance between the digit image and each image in the dictionary, wherein the receiver device concatenates all the binary segments to obtain the right binary sequence in order to recover the secret message by looking up an ASCII table.

9. The apparatus of claim 8, wherein each image in the dictionary corresponds to a binary segment of the particular length.

10. The apparatus of claim 9, wherein the images of random semantic contents in the dictionary is permutated based on a specified key, wherein each image in the dictionary is associated with the corresponding binary segment of the particular length according to an order of the images of random semantic contents in the dictionary after the permutation.

11. The apparatus of claim 8, wherein the images of random semantic contents in the dictionary have the same background so that edges of the selected images merge naturally when the selected images are combined.

12. The apparatus of claim 8, wherein the at least one microprocessor processor is further configured to:

modify the binary sequence by adding a header binary segment to a beginning of the binary sequence; and

modify the binary sequence by adding a set of random bits to an end of the binary sequence to make a length of the modified binary sequence an exact multiple of the

particular length, wherein the plurality of binary segments are obtained based on the modified binary sequence.

13. The apparatus of claim 8, wherein each binary segment of the plurality of binary segments is mapped to a predetermined semantic content based on a position of the binary segment in the binary sequence, wherein, to select the image for the binary segment, the at least one microprocessor processor is configured to:

select an image of the predetermined semantic content from a sub-dictionary of the dictionary based on the binary segment, the sub-dictionary comprising images of the predetermined semantic content.

14. The apparatus of claim 8, wherein the semantic content is a numeral digit and the images of random semantic contents are images of random numeral digits, wherein the combination of the semantic contents of the selected images is a plurality of numeral digits.

15. A non-transitory computer-readable medium storing computer executable code, comprising instructions for:

encoding, by a transmitter device, a secret message to obtain a binary sequence;

obtaining, by the transmitter device, a plurality of binary segments of a particular length based on the binary sequence;

for each binary segment of the plurality of binary segments, selecting, by the transmitter device, a digit image of a semantic content from a dictionary of images of random semantic contents based on the binary segment;

combining, by the transmitter device, the selected images to form at least a portion of a cover image denoting a combination of the semantic contents of the selected images to create a stego-cover and transmitting the stego-cover to a receiver device over a communication network;

initiating, by the receiver device, a decoding procedure by searching a right digit in a permuted dictionary of images by duplicating the permutation with a specified key to obtain the right order of images in the dictionary; and

for each digit image separated from the stego-cover, calculating, by the receiver device, a distance between the digit image and each image in the dictionary, wherein the

receiver device concatenates all the binary segments to obtain the right binary sequence in order to recover the secret message by looking up an ASCII table.

16. The non-transitory computer-readable medium of claim 15, wherein each image in the dictionary corresponds to a binary segment of the particular length, wherein the images of random semantic contents in the dictionary is permutated based on a specified key, wherein each image in the dictionary is associated with the corresponding binary segment of the particular length according to an order of the images of random semantic contents in the dictionary after the permutation.

17. The non-transitory computer-readable medium of claim 15, wherein the images of random semantic contents in the dictionary have the same background so that edges of the selected images merge naturally when the selected images are combined.

18. The non-transitory computer-readable medium of claim 15, the computer executable code further comprises instructions for:

modifying the binary sequence by adding a header binary segment to a beginning of the binary sequence; and

modifying the binary sequence by adding a set of random bits to an end of the binary sequence to make a length of the modified binary sequence an exact multiple of the particular length, wherein the plurality of binary segments are obtained based on the modified binary sequence.

19. The non-transitory computer-readable medium of claim 15, wherein each binary segment of the plurality of binary segments is mapped to a predetermined semantic content based on a position of the binary segment in the binary sequence, wherein the instructions for selecting the image for the binary segment comprises instructions for:

selecting an image of the predetermined semantic content from a sub-dictionary of the dictionary based on the binary segment, the sub-dictionary comprising images of the predetermined semantic content.

20. The non-transitory computer-readable medium of claim 15, wherein the semantic content is a numeral digit and the images of random semantic contents are images of random

numeral digits, wherein the combination of the semantic contents of the selected images is a plurality of numeral digits.