



Steganography by Multipoint Arabic Letters



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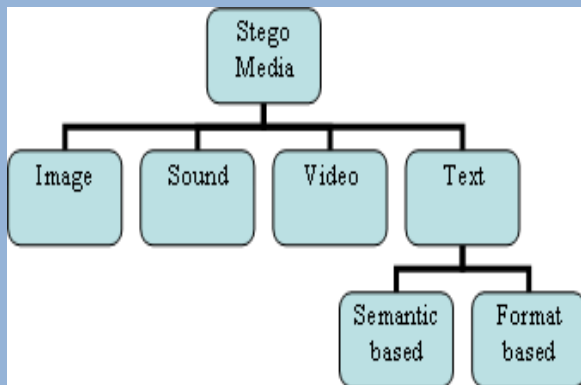
Abstract

Security issues are taken into consideration for many applications, where transferring sensitive data over network must be protected from any man-in-the-middle attackers. privacy of data can be granted using encryption, by changing transmitted data into cipher form. Apart from encryption, hiding of data represents another technique to transfer data without being noticeable by an attacker which is called Steganography. In this paper, we will discuss the main concepts of Steganography and a carrier media that is used for this goal.

Introduction

Steganography is a Greek words coming from cover text. Where "Stegano" means hidden and "Graptos" means writing. The secure data will be embedded into other object, so middle attacker can't catch it [1]. Invisible ink is an example for Steganography using a readable message transfer between source and destination. Everyone in the middle can read the message without having any clue about the hidden data. On other hand, authorized persons can read it depending on substances features [2][3].

Ancient Greeks used to shave the messenger head and then wait until hair grow back, then the message will be sent to the destination [1]. Depending on this method we have 2 possibilities:-
Message arrived so the receiver can read the message and recognize if message is changed or not.
If message did not arrive that mean the attacker detect the message.



Method

Pointed letter represents one of characteristic in Arabic/Persian languages. Where English language does not have the same number only we can find (i, j).

Table I Arabic letters regards to number of point

letter	Number of point
ا, ح, د, ر, ص, ط, ع, ك, ل, ه, و	0
ب, ج, خ, ذ, ز, ض, ظ, غ, ف, ق	1
ت, ث, ي	2
ث, ش	3

Our algorithm tries to hide data in multipoint Arabic/Persian letter like (ث, tha) where in Arabic language we have five letters, eight in Persian.

Method (cont)

Each character can hide 2 bits determine by shifting and distance between letter points.

Result

Table II Capacity of webpage for different Arabic website

#	Page Name	Page Size	Character # 2 point or more	Capacity Ratio (Bit/ Kilobyte)
1	aljazeera.net	23.8 KB	1245	105
2	daralhayat.com	15.4 KB	968	126
3	salahws.com	10.3 KB	535	104
4	holyquran.net/tadabur	13.8 KB	516	75
5	khayma.com	21.8 KB	499	46

Table III Vertical Point shifting versus Multipoint algorithm

	Number of letter	Number of hidden bit
Pointed letter	50	50
Multipoint letter	29	58

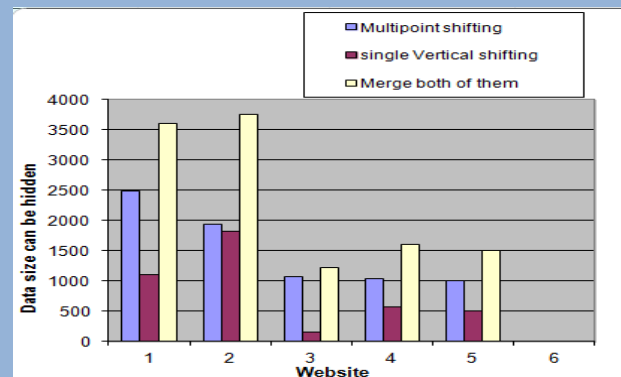


Figure 1. Merge between Vertical and multipoint algorithm

Conclusion

In our paper we introduced new text Steganograph in Arabic multipoint letters. Our algorithm deals with two bits for each multipoint letter,

References

- [1] Aelphaeis Mangarae "Steganography FAQ," Zone-H.Org March 18th 2006
- [2] S. Dickman, "An Overview of Steganography," July 2007.
- [3] V. Potdar, E. Chang. "Visibly Invisible: Ciphertext as a Steganographic Carrier," Proceedings of the 4th International Network Conference (INC2004), page(s):385-391, Plymouth, U.K., July 6-9, 2004