Chapter 14
Secured Information Exchange Using Haptic Codes

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ABSTRACT

This chapter discloses an invention related to methods and systems to provide secure and custom information exchange code for the users of haptic or kinesthetic communication devices in a variety of applications. The proposed information exchange codes are named as "haptic codes," where it maps several touch interactive locations into a single information exchange code. Thus, the proposed haptic code facilitates the representation of different notions to unique information exchange character/digit/symbol. A method has been invented to design eight such codes from the intuitive touch gestures (ITG) of user, each of which uses double-touch on arbitrary location within the touch pad/screen without shifting hand position on every touch. Hand position may or may not be the same after the generation of every ITG. Haptic codes are made secure by incorporating a new cryptographic system, which employs polar graph for encoding and decoding such locations using polar curves as shareable keys. Therefore, haptic codes can be exchanged for secure communication and read by devices that supports to touch.

FIELD OF INVESTIGATION

The present invention relates to development of information exchange code for short and secured communication using human finger gestures on haptic or kinesthetic communication device. These new information exchange codes are named as custom

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haptic code. To enhance the security of such haptic codes graphical key based encryption and decryption system is also incorporated particular to kinesthetic communication.

PRIOR ART

In an Information communication system, coding schemes to represent data or Coding is the vital and fundamental scheme in any information exchange process, it requires language and its characters must be represented as unique code. Code is nothing but a unique number associated with every character so as to facilitate the information exchange unambitious between sender and receiver. There are quite a few standards existing in the literature to represent text, special character in communications equipment, and other devices. The Binary Coded Decimal (BCD) is a 4-bit code and each decimal digit is represented by 4 binary digits. Extended binary coded decimal interchange code (EBCDIC), is an 8-bit code, can represent 256 characters to represent English alphabets and numerals. ASCII stands for American standard code for information interchange (S. Tabirca et al, 1998). It was published in 1968 by ANSI (American National Standard Institute) (C. V. Krishna et al, 2016). It is the most widely used coding scheme for personal computers. The 7-bit code can represent 128 characters. An 8-bit code can represent 256 characters and to represent graphic symbols. ASCII, EBCDIC are character encoding based on the English alphabet. Unicode is an industry standard to represent and manipulate text expressed in most of the world's writing systems. Indian script codes for information interchange (ISCII) code are characters required in the ten Brahmi based Indian scripts.

In earlier 1990, key boards were the major form input device involved in information exchange system. Hence, the entire standard tried to allocate a number to each key on the keyboard that can be traded as code for communication system. All those standards are prompt to map a number to unique character for their preferred linguistics/language, it leads to one to one mapping for a character. Table 1, shows few ASCII codes for few English uppercase character and its associated decimal / hexadecimal / binary codes.

Table 1. ASCII coding of English alphabets

Character	**A**	**B**	.....	**Y**	**Z**
Decimal	65	66	.....	89	90
Hex	41	42	.....	59	5A
Binary	01000001	01000010	.....	01011001	01011010