Morse code translator using Python

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ABSTRACT

Morse code is a process of transmitting text information as a series of on-off tones and lights or clicks .if they use a tapping device recipient can understand the message without additional decoding equipment. Morse code is represented by the form of dits and dahs. Here dits refer to dots and dahs refer to dash. Morse code used to transmit only numerals at first. After that, Alfred Vail included letters and characters. Morse code can be transmitted by using electric telegraph wire, light, and sound, through a different medium in different ways. Tap code is used by American prisoners. Morse code is used for long-distance communication. International Morse code was devised by European nations in 1851. It is the base for the morse code to transmit or receive. Morse code is a character encoding and decoding scheme.

Keywords— PYTHON, Cipher, Dechiper

1. INTRODUCTION

This is the implementation of a morse code translator using Python.The translator makes use of a programming language as a key and a simple algorithm of changing characters to dots and dash and vice versa. This can be used in different areas like morse code for ships at sea to communicate over long distance using large lights. Morse code is mainly used in world war because it greatly improved the speed of communication.Naval ships were able to communicate with their bases and provide critical information to each other. War planes also used morse code to detail locations for enemy ships, bases , and troops and relay them back to headquarters. The rapid development of wireless technologies over the last decade has added great convenience to our lives. To accommodate different application requirements for wireless performance (e.g., range, throughput, reliability, timeliness, and energy), a wide range of wireless technologies have been proposed. Many of these technologies such as Wi-Fi and zig bee, operate in the various ways of the public , operational way of the. A possible solution is to obtain data by synthetic instead of natural means. Synthetic data are generated using computer algorithms instead of being collected from real-world scenarios. The public spectrum .where devices much compete with each other to resources. The uncoordinated competition among incompatible wireless technologies leads to considerable low reliability. To the best of our knowledge.Morse

is the first work that leverages all existing traffic to achieve the technology communication between to Heterogeneous. The training stage is data-hungry and typically requires thousands of labelled examples. It is therefore often a challenge to obtain adequate amounts of high quality and accurate data required to sufficiently train a NN. The use of the hash maps is most predominant in python for accessing the data structure .so every key of the character has its value in the database we need to access through a function called itertools. Cipher stores the morse translated the form of the English string. Decipher stores the English translated form of the morse string. Context stores morse code of a single character .i keeps count of the spaces between morse characters. Message 'stores the string to be encoded or decoded. The revolutionary is knowledgeable of all of the special unwritten Morse code symbols for the standard Prosing's for Morse code and the meanings of these special procedural signals in standard Morse code communications protocol.

2. LITERATURE SURVEY

Sourya Dey, Keith M. Chugg and Peter A. Beerel presented a paper on Morse code datasets for machine learning [1]. They have presented an algorithm to generate synthetic datasets of tenable difficulty on the classification of morse code symbols for supervised machine learning problems. They completely used machine learning for this. They have done this process in four steps frame portioning, assigning values for intensity levels, noising, mass generation. Paparao Nalajala Bhavana Godavarth, M Lakshmi Raviteja, Deepthi Simhadri presented a paper on Morse code generator using Microcontroller using Alphanumeric keyboard [2]. They presented the paper using radiotelegraphy .they used keypads etc., the clock signal is generated by matrix keypad.it uses an LCD, led, buzzer, most importantly transmitter.it uses a microcontroller for processing the morse code to display on the LCD screen. Dr A. Murugan, R. Thilagavathy presented a paper on Cloud Storage Security Scheme using DNA Computing with Morse code and Zigzag Pattern [3].storage and exchange of data are done in cloud computing, DNA computing, zigzag chippers. It uses a DNA of an organism to process an input and by computing this they take initially a stream of characters and converted to binary data, to DNA sequence and then to morse code and then to zigzag pattern the resultant is the chipper text. Zhimeng Yin, Wenchao Jiang,

Song Min Kim, Tian He presented a paper on C-Morse: Cross-technology Communication with Transparent Morse.Coding [4].it uses a Wi-Fi to zig bee and viceversa it uses a transport protocol like TCP, UDP. degredations are very low nearly 4%. The Wi-Fi___33 sender modulates its symbols by only perturbing the transmission timing of through data packets and control frames within a negligible delay. In this way, C-Morse constructs the statistically recognizable energy patterns in the ISM band in a transparent way. On top of the modulator, CMorse has its multiple access control, and a packet buffer to opportunistically utilize the existing data packets, avoiding the need for generating dummy packets. In addition to transparency, Fig. 16a and provide the CTC throughput while maintaining transparency. With 100 packets/s, CMorse achieves a throughput of 12bps and manages to boost its CTC throughput to 137bps at 800 packets/s. For a fair comparison, the CTC sender avoids the generation of dedicated packets (e.g. beacons or data packets) and does not require synchronization. In the literature, only Free Bee (asynchronous version) meets these conditions with a 14.6bps throughput. The 9× throughput gain is achieved by utilizing all kinds of existing Wi-Fi traffic, instead of the limited beacons. Note that the CTC throughput discrepancy between UDP and TCP is due to the different tolerable delay bounds (10ms for TCP and 15ms for UDP). Sérgio Silva, António Valente, Salviano Soares, M.J.C.S. Reis, Jean Paiva, Paulo Bartolomeu presented a paper on morse code translator using the Arduino platform crafting the future of microcontrollers[5]. This revolutionary idea allows long distance communication between people connecting humanity and building bridges between nations. By the end of the 19th century, however, new technologies began to emerge, many of them based on the same principles first developed for the telegraph system. In time, these new technologies would overshadow the telegraph, which would fall out of regular widespread usage, but as in the past, today the same principles developed by the telegraph can craft again the future so researchers think with the rise of Li-Fi and VLC. The electric equivalent circuit is shown on Figure 6. There are two buttons, one for the dot signal and one for the dash.S1 represents the dot and S2 the dash. The LED will blink at the same frequency of the dash or dot, making Morse visible besides audible. The electric circuit was drawn using the IDE Fritzing.

3. SYSTEM ARCHITECTURE
During this process of translation from the above diagram, we can say that when a character is given as input by translating it we get a morse code from the hashmaps as output. When Morse code is given as input then by translating it we get a character as output. The use of the hashmaps is most predominant in python for accessing the data structure .so every key of the character has its value in the database we need to access through a function called itertools.
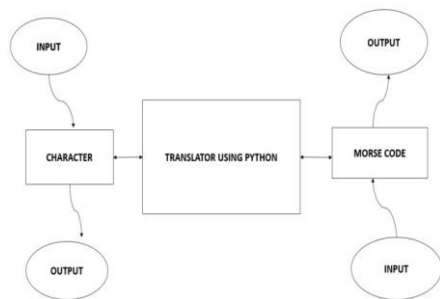

Fig. 1: System architecture

Because we choose python as it is efficient in both fast and accessing a database. Cipher stores the morse translated the form of the English string. Decipher stores the English translated form

of the morse string. Context stores morse code of a single character. It keeps count of the spaces between morse characters.

4. METHODOLOGY
4.1 Encryption
In case of encryption we extract each character (if not a space) from a word one at a time and match it with its corresponding morse code stored in whichever data structure we have chosen (if you are coding in python, dictionaries can turn out to be very useful in this case) Store the morse code in a variable which will contain our encoded string and then we add a space to our string which will contain the result. While encoding in morse code we need to add 1 space between every character and 2 consecutive spaces between every word. If the character is a space then add another space to the variable containing the result. We repeat this process until we traverse the whole string.

4.2 Decryption
In the case of decryption, we start by adding a space at the end of the string to be decoded (this will be explained later). Now we keep extracting characters from the string till we are not getting any space. As soon as we get a space we look up the corresponding English language character to the extracted sequence of characters (or our morse code) and add it to a variable which will store the result. Remember keeping track of the space is the most important part of this decryption process. As soon as we get 2 consecutive spaces we will add another space to our variable containing the decoded string. The last space at the end of the string will help us identify the last sequence of Morse code characters (since space acts as a plaintext (English characters) take the place of keys and the ciphertext (Morse code) form the values of the corresponding keys. The values of keys can be accessed from the dictionary in the same way we access the values of an array through their index and vice versa.

4.3 International Morse Code
- Short sign dot or dit (•): 1
- longer sign, dash or dah (–): 111
- Intra character gap between the dots and dashes within a character : 0
- The short interval between letters: 000
- The medium interval between words: 0000000
- One dash = Three dots
- The space between parts of the same letter = One dot
- The position between letters = Three dots
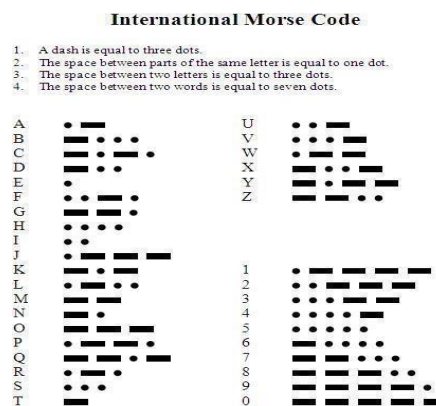- The position between words = Seven dots [14]

Fig. 2: International Morse Code

5. IMPLEMENTATION
Python provides a data structure called dictionary which stores information in the form of key-value pairs which is very convenient for implementing a cipher such as a Morse code. We

can save the morse code chart in a dictionary where (key -value pairs) => (English character – morse code). The plaintext (English characters) take the place of keys and the ciphertext (Morse code) form the values of the corresponding keys. The values of keys can be accessed from the dictionary in the same way we access the values of an array through their index and vice versa. We know that we have hashmaps in python which is a form of data used to find the frequency of characters in a string. () Basically a dictionary is like a list instead of integer index it can be of any type.to define a dictionary we use a key value pair with a colon between them iter () method returns an iterator for the given object .in case of sentinel provided, it returns the iterator object that calls the callable object until the sentinel character isn't found. We need to import the dictionary by calling the function MORSE_CODE_DICT (). We can use any of the python compilers like python 3.7(32bit). or any other online python compilers .so for fast output we can use online python compilers.
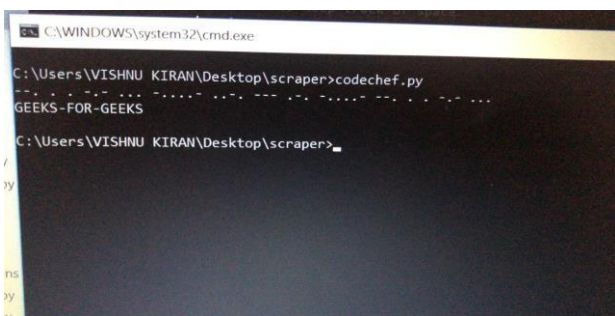
Fig. 3: Morse code to character

6. ALGORITHM
The algorithm is very simple. Every character in the
The English language is substituted by a series of 'dots' and 'dashes' or sometimes just singular 'dot' or 'dash' and vice versa

6.1 Code to Encrypt

```
# Function to encrypt the string  # according to the morse code chart
def encrypt(message):
    cipher = ''    for letter in message:        if letter != ' ':
        # Looks up the dictionary and adds the
        # corressponding morse code
        # along with a space to separate
        # morse codes for different characters          cipher +=
MORSE_CODE_DICT[letter] + ' '      else:
        # 1 space indicates different characters        # and 2
indicates different words
        cipher += ' '
    return cipher
```

6.2 Code to Decrypt

```
# Function to decrypt the string  # from morse to english  def
decrypt(message):
    # extra space added at the end to access the
    # last morse code     message += ' '    decipher = ''    citext = ''
for letter in message:        # checks for space     if (letter != ' '):
      # counter to keep track of space      i = 0
      # storing morse code of a single character
      citext += letter     # in case of space      else:
      # if i = 1 that indicates a new character      i += 1
      # if i = 2 that indicates a new word      if i == 2 :
      # adding space to separate words    decipher += ' '    else:  #
accessing the keys using their values (reverse of  encryption)
decipher +=
list(MORSE_CODE_DICT.keys())[list(MORSE_CODE_DICT
  .values()).index(citext)]
    citext = return decipher.
```

7. CONCLUSION
This is the implementation of MORSE CODE translator using python. This system was designed to transmit message securely to long distance. The design makes use of a programming language python. This design can be used in different areas like long communication, military, external affairs etc. By using this system there is no need of tapping device for transmission .so this overcomes the security problems.

8. REFERENCES
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[3] Dr A.Murugan, R.Thilagavathy Associate Professor, PG and Research Department of Computer Science,
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[5] Zhimeng Yin, Wenchao Jiang, Song Min Kim, Tian, Department of Computer Science and Engineering, University of Minnesota, U.S.
[6] Sérgio Silva, António Valente, Salviano Soares, M.J.C.S. Reis ,Jean Paiva, Paulo Bartolomeu School of Sciences and Technology, Engineering Department UTAD, Vila Real, Portugal ,INESC TEC -INESC Technology and Science (formerly INESC Porto, UTAD pole), Porto, Portugal, IEETA -Institute of Electronics and Informatics Engineering of Aveiro, Aveiro, Portugal ,Globaltronic - Electronics and Telecommunications - Águeda, Portugal .