MORSE CODE TRANSLATOR USING ARDUINO

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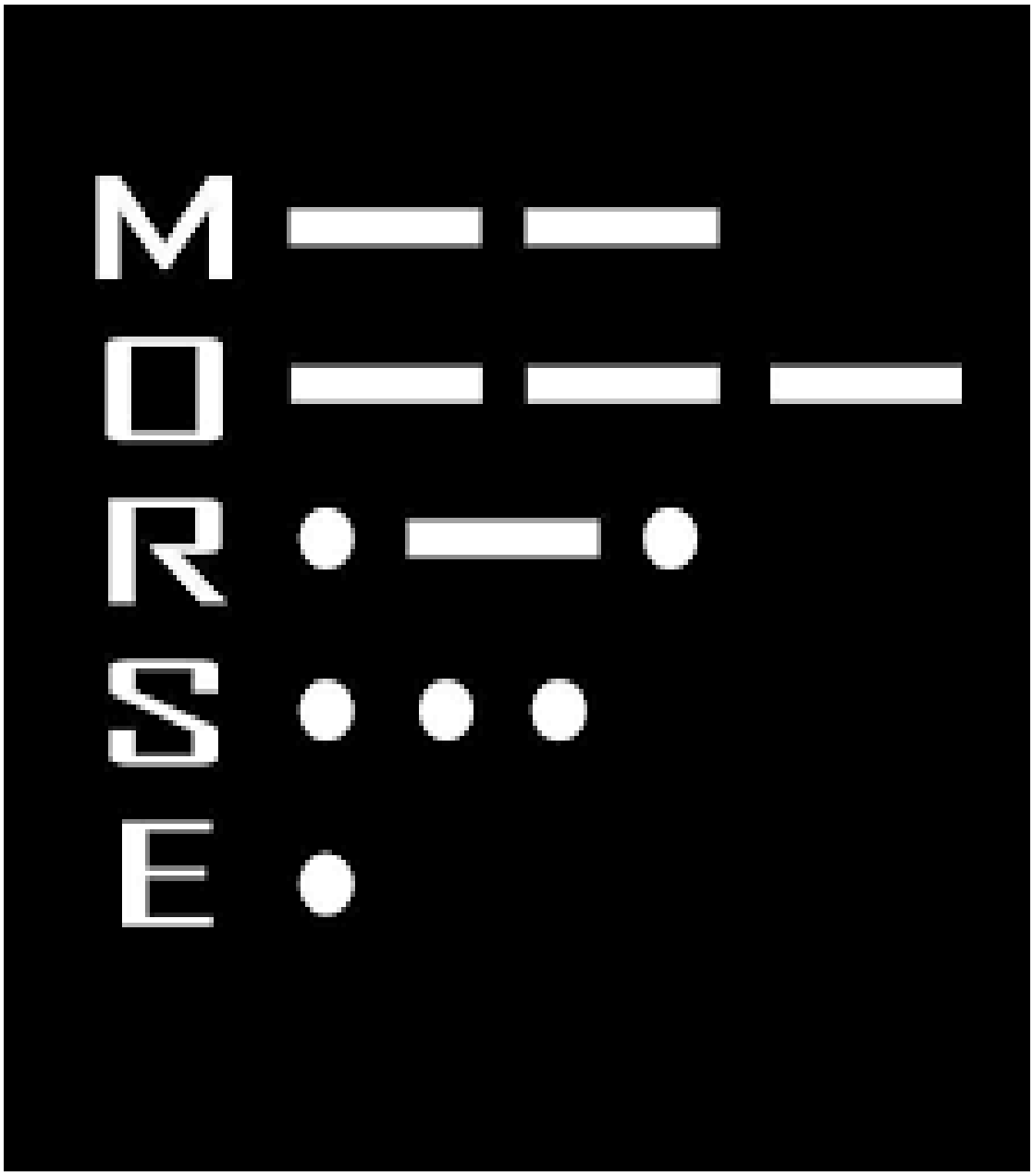


Contents

1 Abstract

Morse code is a method of communicating text data as a series of on-off tones, lights, or clicks. If they utilize a tapping device, the recipient will be able to interpret the message without any additional assistance like Decoding apparatus, Morse code is written in the form of dots and dashes. Initially, Morse code was employed to send simple numbers. Following that, Letters and characters were supplied by Alfred Vail. Morse code can be used. relayed with the use of an electric telegraph line, light, and sound through a different media in many ways The tap code is employed. by American detainees Morse code is used for long-distance communication. communication. The International Morse code was created in 1851, by European countries. It serves as the foundation for morse code. It is the base for the morse code to transmit or receive. Morse code is a character encoding and decoding scheme. Morse code translator is used for translating the text into morse code and morse code into text.

2 Introduction

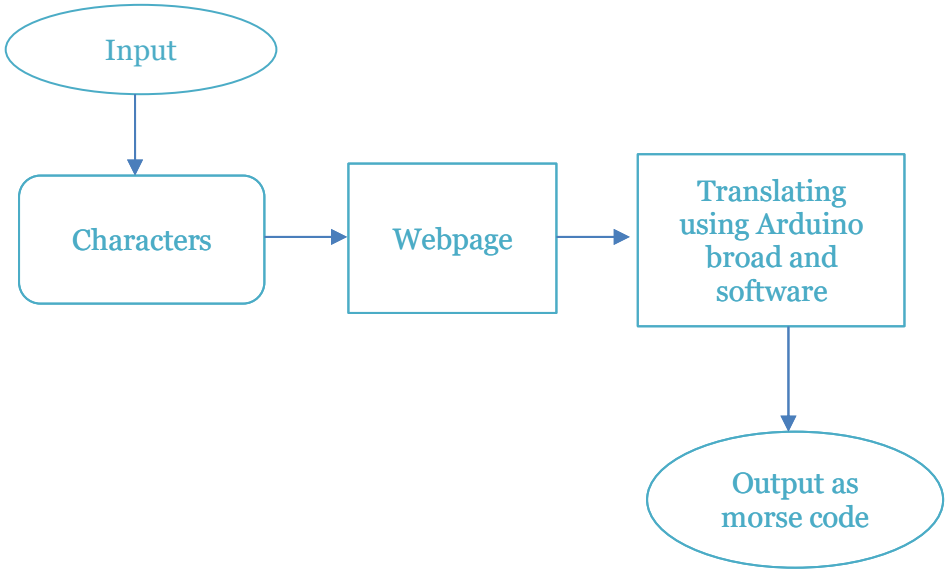
The system should be implemented considering a user's convenience in using these translators. This will be a useful platform for all those that needs to decode or encode the morse code using a dedicated web platform. This can be used in different areas like morse code for ships at sea to communicate over long distances 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. Warplanes 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 various ways the public, operational way the. To the best of our knowledge, we have designed the Morse code translator using Arduino and c for the coding part.

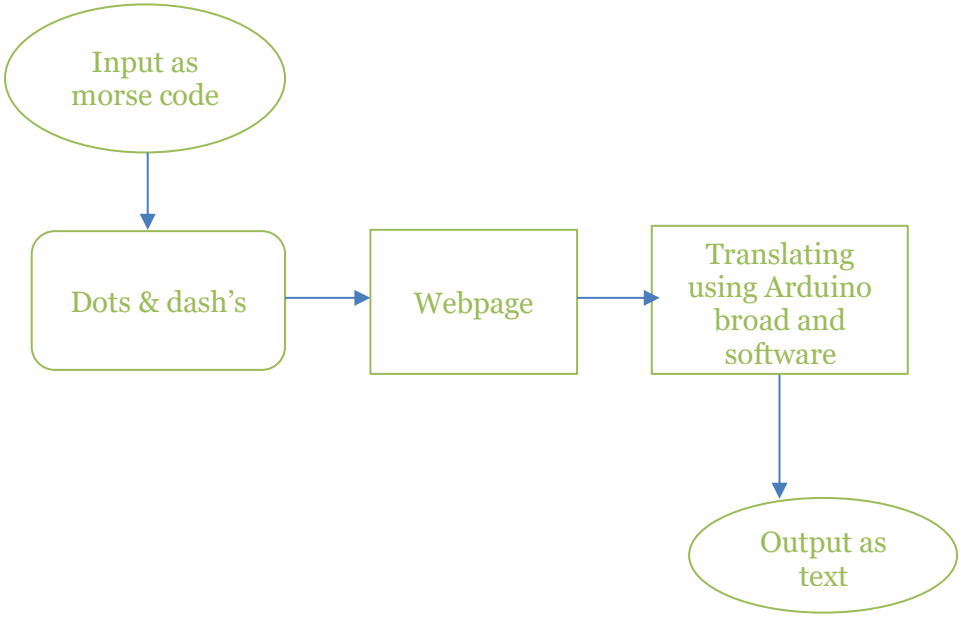
This webpage will allow users to choose their translation mode (encode or decode). Depending on their choice further, these operations will be executed. An Arduino Uno broad is set to encode the text code that the user enters into the morse code. The result of this can be seen on the webpage and additionally on led blinks and buzzer sounds. And for the decoding, the input can be provided using the switches, here the long press of the switch is considered as a dash (_) and the normal press as the dots(.). The Arduino software code is run, when input is submitted and the output would be displayed on the webpage.

3 System Architecture

During this process of translation from the below diagram, we can say that when a character is given as input by translating it, we get a morse code from the hashmaps (hashmaps here refers to the mappings in code associated to each alphabet) as output. When Morse code is given as input then by translating it we get a character as output.

1.1 Encoding





1.2 Decoding

4 Methodology

4.1 Encoding

In case of encoding, we extract each character (if not a space) from a word one at a time and match it with its corresponding morse code character in the logic written. 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 Decoding

In the case of decoding, we start listening to the button for input. When the button is long pressed its dash, short press is dots, whereas no press will be considered as space. The input here is taken into a variable where each set of dots and dashes combinations are decrypted by matching the combinations to already written alphabetical logic in code. We repeat this process until we traverse the whole input. The characters are decrypted and shown on the website as output.

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]

The dots and dash signals can be made using led light blinks, where the light off is dot and light on is dash. Or we can use buzzer or many other things as the signaling the morse code.

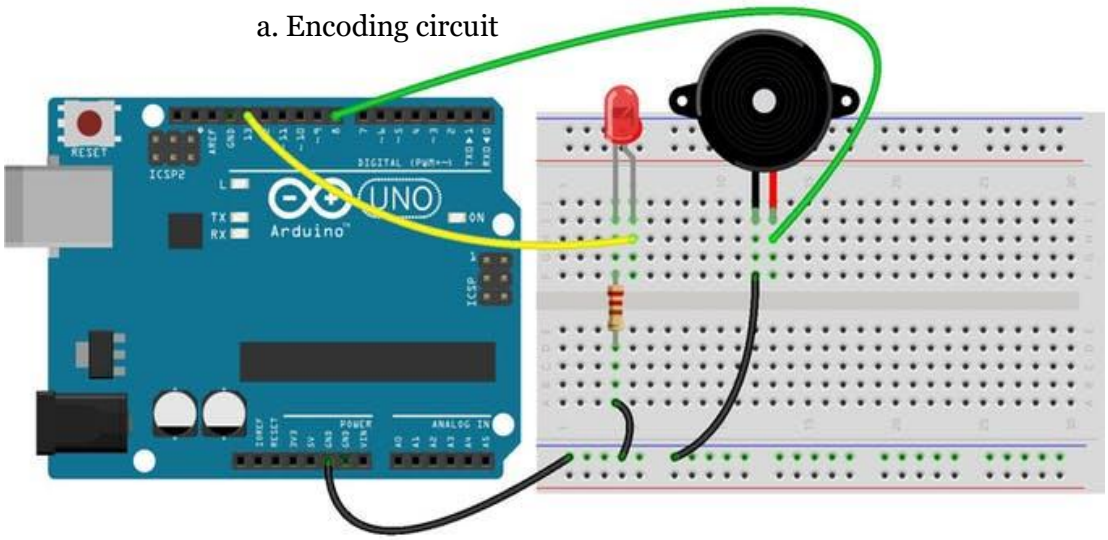
5. Connections

This are the components that are required for encoding the morse code using circuit.,

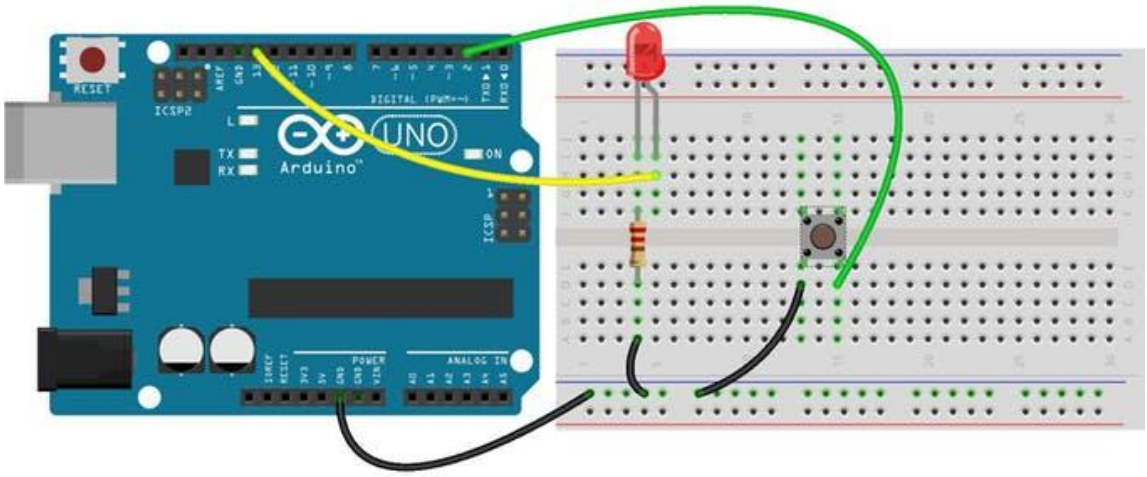
1. Arduino UNO R3
2. ElectroPeak Active Buzzer
3. Jumpwires
4. LED

Here we used Arduino UNO to translate a text to Morse code. Upload this code on your Arduino board and open your serial monitor window. Type your desired word or text and receive it in Morse code, then you can send it as light and sound. Below circuits are simple and easy connections that make the translating work much simpler.

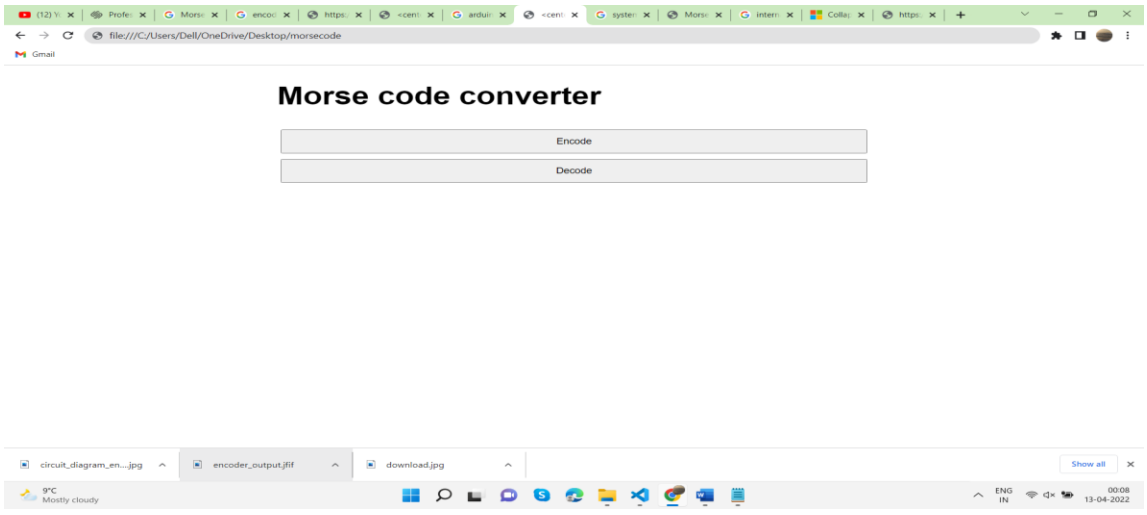
a. Encoding circuit



b. Decoding circuit



c. simple webpage



6. Code for implementation

The code for implementing the these morse code translator and logics are in the below link.

https://github.com/keerthiravilla/Morse-code/blob/main/Encoder_code
https://github.com/keerthiravilla/Morse-code/blob/main/decoder_code

7. Conclusions

This is the implementation of MORSE CODE translator using Arduino. This system was designed to transmit message securely to long distance. The design makes use of a programming language C for logics and algorithms. 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. Moreover, all these things, morse code is fun to learn and implement in our daily lives.

8. Reference and materials

These are the materials and reference's we have gone through to understand and implement these morse code translator project.

- Sourya Dey, Keith M. Chugg and Peter A. Beerel presented a paper on Morse code datasets for machine learning university of south California Los Angeles.
- Paparao Nalajala, Bhavana Godavarth , M Lakshmi Raviteja, Deepthi Simhadri presented a paper on Morse code generator using Microcontroller using Alphanumeric keyboard, Department of electronics institute of Aeronautical, Hyderabad.
- https://create.arduino.cc/projecthub/electropeak/how-to-make-a-morse-code-translator-with-arduino-d6ecc8?ref=user&ref_id=573543&offset=1