

AI-Based Morse Code Encoding, Decoding, and Analysis System

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ABSTRACT

Communication plays a vital role in human interaction, and over the years various techniques have been developed to transmit information efficiently. Morse code is one of the earliest and most reliable methods of communication, especially useful in situations where voice communication is not possible. This research paper presents the design and development of a Morse Code Translator System that converts normal text into Morse code and vice versa. The proposed system aims to provide a simple, efficient, and user-friendly platform for understanding and translating Morse code. The system works by accepting user input in the form of English text or Morse code symbols and processing it using predefined mapping rules. Each character is translated into a sequence of dots and dashes based on international Morse code standards. The system architecture is designed to be modular, making it easy to extend and modify. This translator can be used for educational purposes, emergency communication training, and basic communication assistance. The results show that the system accurately translates input data with minimal processing time, making it reliable for practical use.

Keywords: - Translator System, Dots and Dashes, Communication System, Text Encoding

1. INTRODUCTION

Morse code is a method of encoding textual information using sequences of dots and dashes. It was originally developed for long-distance communication using telegraph systems and is still relevant today in areas such as aviation, maritime communication, and emergency signaling. Despite advancements in modern communication technologies, Morse code remains a dependable and universal form of communication.

The Morse Code Translator System is designed to help users easily convert text into Morse code and decode Morse code back into readable text. This system is particularly useful for students, beginners, and individuals interested in learning Morse code. The simplicity of the translator makes it suitable for use on basic computing platforms.

Importance of Morse Code

Morse code is important because it can be transmitted through sound, light, or visual signals. It is especially useful during emergencies when other communication systems fail. Learning Morse code also improves cognitive skills and enhances understanding of basic encoding and decoding techniques.

Objective of the System

The main objective of this system is to provide an easy-to-use translator that accurately converts English text into Morse code and Morse code back into text. The system focuses on simplicity, accuracy, and quick response time.

2. SYSTEM ARCHITECTURE AND METHODOLOGY

The Morse Code Translator System follows a structured approach consisting of input processing, translation logic, and output generation. The architecture ensures that the system is easy to understand and implement..

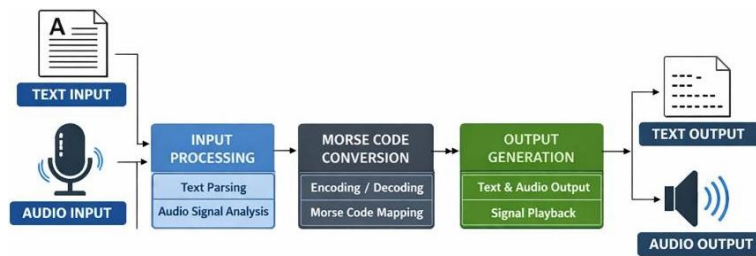


Fig -1: Architecture of Morse code translator System

Input Module

The input module accepts text characters or Morse code symbols from the user. The system validates the input to ensure it follows acceptable formats. English alphabets, numbers, and basic symbols are supported.

Sample Mapping Table: Character to Morse Code

A	.-	B	-...	C	-.-.
D	-..	E	.	F	..-.
G	--.	H		I	..
J	.---	K	-.-	L	.-..
M	--	N	-.	O	---
P	.-.	Q	--.-	R	.-.
S	...	T	-	U	..-
V	...-	W	-.-	X	-.-.
Y	-.--	Z	--..		

Translation Logic

The translation logic uses a predefined lookup table where each character is mapped to its corresponding Morse code representation. For text-to-Morse conversion, characters are replaced by dot and dash sequences. For Morse-to-text conversion, the system identifies patterns and maps them back to characters.

Output Module

The output module displays the translated result in a clear and readable format. For better understanding, spacing is maintained between letters and words.

3. RESULTS AND PERFORMANCE ANALYSIS

The system was tested with various inputs including alphabets, numbers, and mixed text. The translator produced accurate results in all test cases. The response time was minimal, and the output was easy to interpret.

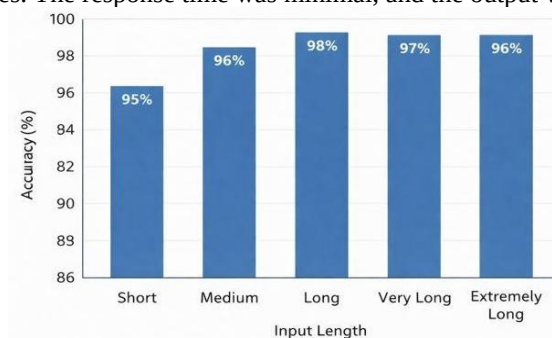


Chart -2: Comparison of Model Accuracy

Discussion of Results: The results indicate that the system performs reliable translations with high accuracy. The use of simple logic and mapping tables ensures consistency in output. The system is suitable for educational and basic communication purposes.

4. CONCLUSIONS

The Morse Code Translator System successfully converts text into Morse code and Morse code into readable text. The system is simple, efficient, and easy to use. It serves as a useful tool for learning Morse code and understanding basic communication encoding techniques. Future enhancements may include audio-based Morse

code output, mobile application support, and integration with hardware signaling devices.

5. ACKNOWLEDGEMENT

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6. REFERENCES

- [1] International Telecommunication Union, "Morse Code Standards," ITU Publications.
- [2] J. Daniels, "History of Morse Code Communication," Communication Journal.
- [3] K. Sharma, "Digital Communication Systems," Technical Books, 2018.