

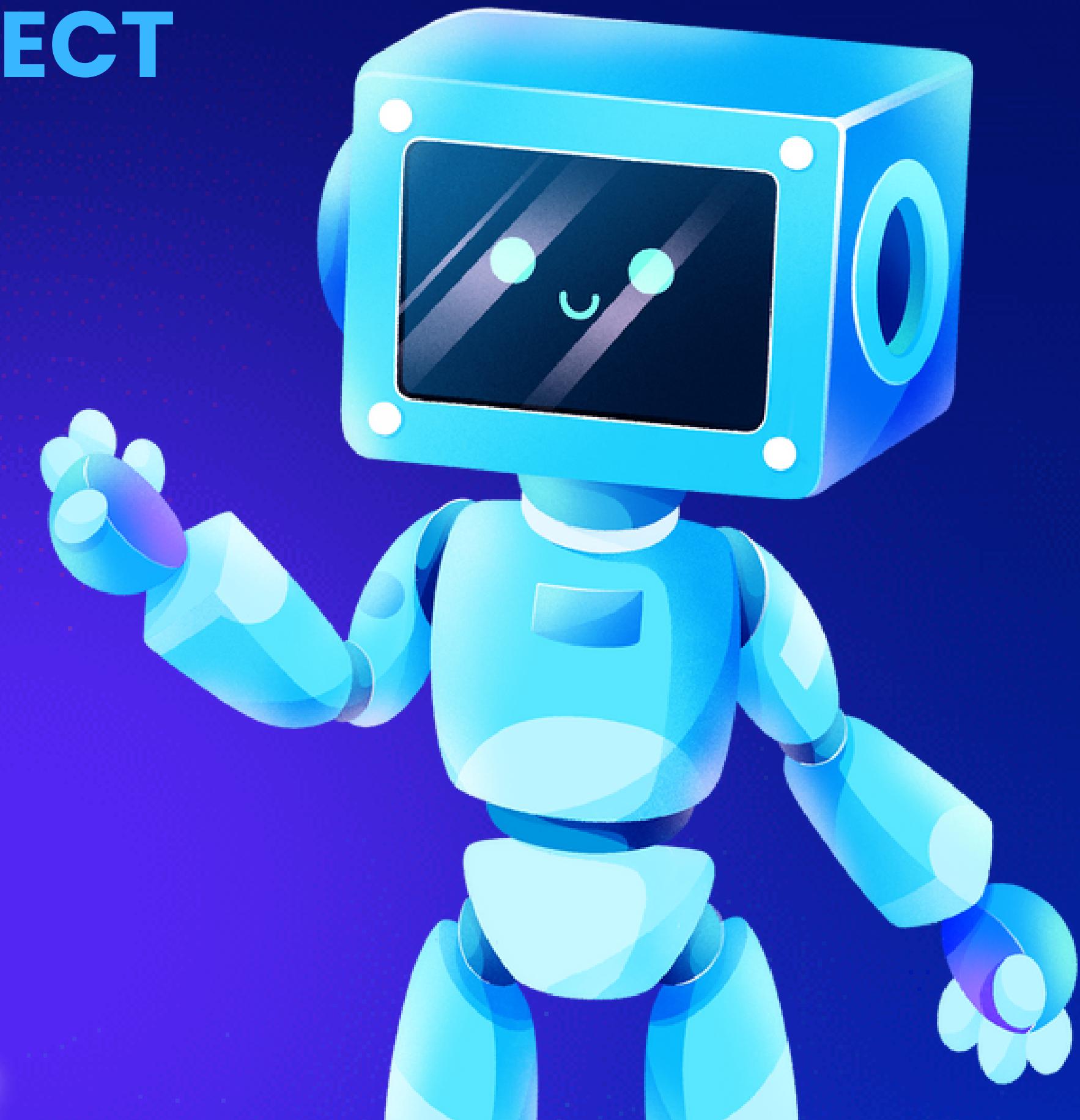
# **FINAL PROJECT**

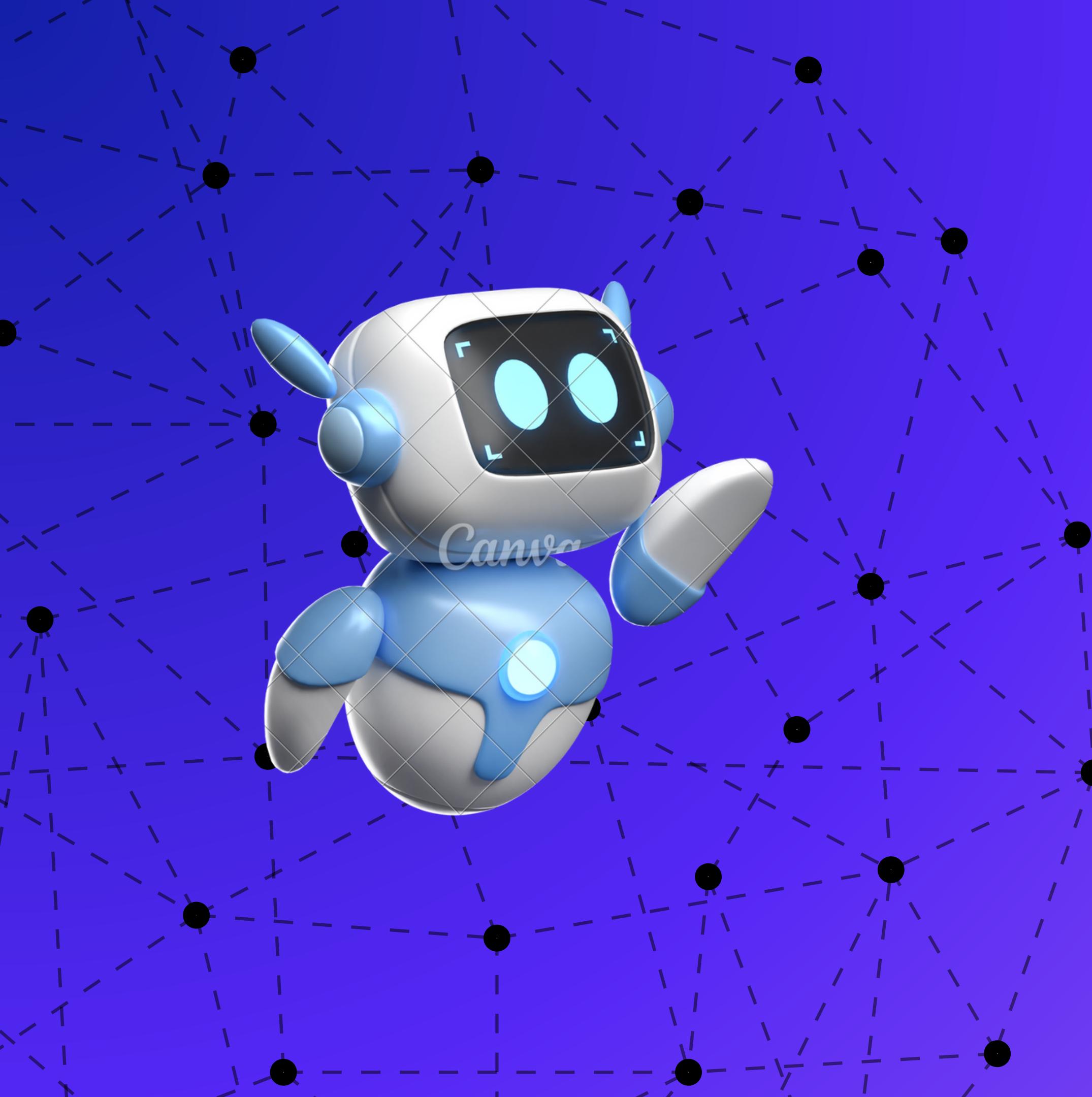
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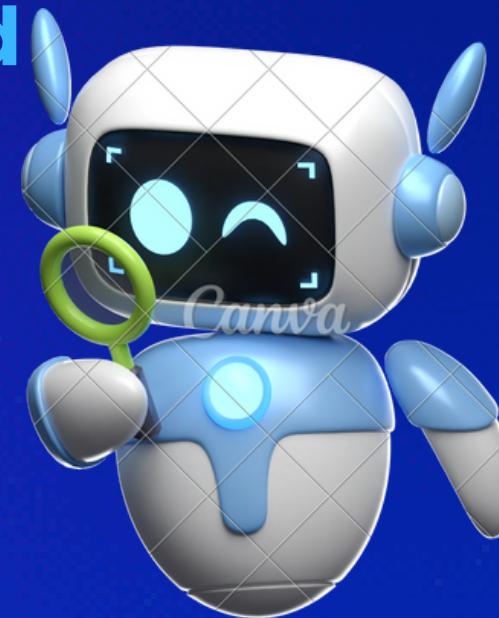


Generative AI  
**NEXT WORD  
PREDICTION**

Using Recurrent Neural Network

# AGENDA:

**Next-word prediction has emerged as a pivotal feature in modern text-based applications, aiming to enhance user typing efficiency and overall experience by suggesting contextually relevant words or phrases as users type. This paper presents the development and evaluation of an advanced next-word prediction system designed to accurately capture the semantics and context of input text to generate timely and contextually appropriate word predictions. The system leverages state-of-the-art machine learning and deep learning techniques, including recurrent neural networks (RNNs) and transformer architectures, to model the intricate relationships and patterns within the text data effectively.**



# PROBLEM STATEMENT:

In today's digital era, text-based communication has become an integral part of our daily lives, encompassing a wide range of applications such as messaging, email, social media, and content creation.

However, typing on mobile devices and keyboards can be cumbersome and time-consuming, leading to decreased typing efficiency, increased user fatigue, and potential errors. One of the significant challenges faced by users is the difficulty in predicting and typing the next word accurately, especially when composing lengthy or complex sentences.

The existing auto-correction and word prediction features in many text editors and mobile keyboards often lack context awareness and semantic understanding, resulting in irrelevant or incorrect word suggestions that do not align with the user's intended message or writing style.





## PROJECT OVERVIEW:

This project leverages advanced deep learning and generative AI techniques to understand and predict the next word or words in a given text sequence based on the context, semantics, user preferences, and writing style.

The project will follow a systematic approach, encompassing the following phases:

- **Data Collection and Preprocessing**
  - **Feature Engineering**
  - **Model Selection and Training**
  - **Evaluation and Optimization**
  - **Integration and Deployment**
- 

# WHO ARE THE END USERS?

## GENERAL USERS:

- **Mobile Device Users**
- **Computer Users**
- **Digital Content Creators**

## Specialized Users:

- **People with Disabilities**
- **Non-Native Language Speakers**

## Professionals and Organizations:

- **Businesses and Enterprises**
- **Developers and Software Engineers**

## Educational Institutions and Researchers:

- **Educators and Students**

## Healthcare and Assistive Technology:

- **Healthcare Professionals**
- **Assistive Technology Users**



# SOLUTION AND ITS PROPOSITION:

## SOLUTION:

- **Advanced Prediction Model**

Develop and implement a sophisticated or deep learning model, such as Long Short-Term Memory (LSTM), Transformer, or neural network-based architectures, to capture complex language patterns, relationships, and nuances in natural language.

- **Context-Aware Prediction Engine:**

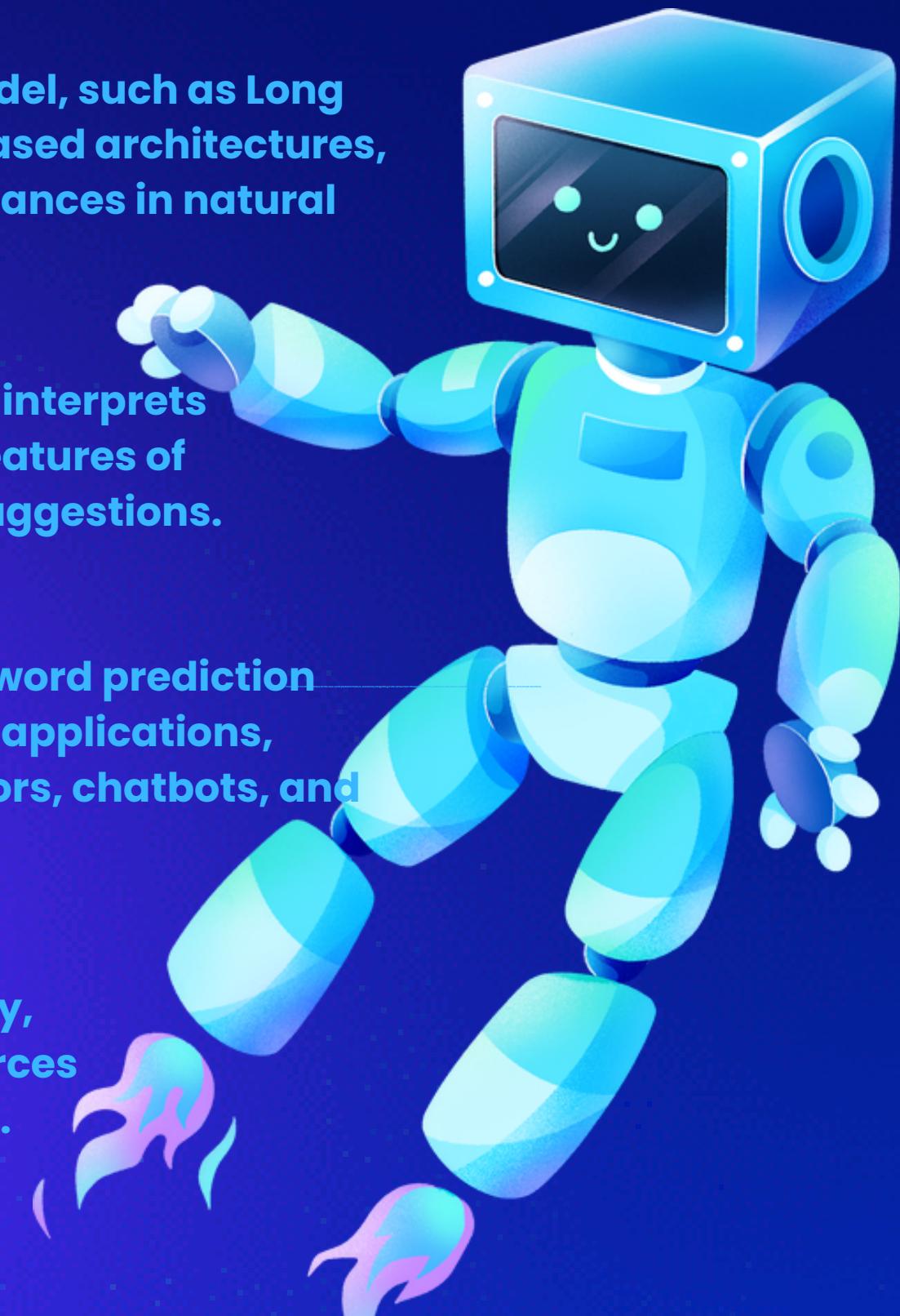
Design a context-aware prediction engine that analyzes and interprets the context, semantics, syntactic structure, and linguistic features of the input text to generate relevant and accurate next-word suggestions.

- **User Interface and Integration:**

Develop a user-friendly and intuitive interface for the next-word prediction feature, seamlessly integrating it into various text-based applications, platforms, and devices, including mobile keyboards, text editors, chatbots, and virtual assistants.

- **Optimization and Personalization:**

Optimize the prediction model and algorithms for efficiency, speed, and scalability, considering the computational resources and performance constraints of the deployment platform.



# PROPOSITION:

## For Users:

- Enhanced Typing Efficiency
- Improved User Experience

## For Developers and Technologists:

- Innovative Technology
- Integration and Customization
- Collaborative Ecosystem

## For Businesses and Organizations:

- Competitive Advantage
- Data-Driven Insights
- Ethical and Responsible AI





## THE WOW IN MY SOLUTION:

- **Accuracy:** "Predict the next word with incredible accuracy, reducing typos and saving time."
- **Contextual Awareness:** "Intelligently adapts to your writing style and predicts words based on context."
- **Multi-Lingual Support:** "Break language barriers! Predict next words in multiple languages."
- **Reduced Cognitive Load:** "Minimize mental effort and write more fluently."



# MODELLING



**Attention-grabbing Visual:**  
**hidden themes emerging from text, or a network**



**Headline:**  
**Clearly explain the role of topic modeling.**



**Explanation:**  
**"Analyzes vast amounts of text to identify recurring themes and word associations".**



**Benefit:**  
**"Provides a deeper understanding of the content, leading to more accurate and relevant next-word suggestions."**

## RESULT:

```
+ Code + Test
1/1 [........................] - 0s 13ms/step - loss: 0.6567 - accuracy: 1.0000
Epoch 03/100
1/1 [........................] - 0s 14ms/step - loss: 0.6444 - accuracy: 1.0000
1/1 [........................] - 0s 14ms/step - loss: 0.6323 - accuracy: 1.0000
Epoch 05/100
1/1 [........................] - 0s 17ms/step - loss: 0.6289 - accuracy: 1.0000
Epoch 06/100
1/1 [........................] - 0s 19ms/step - loss: 0.6094 - accuracy: 1.0000
Epoch 07/100
1/1 [........................] - 0s 19ms/step - loss: 0.5966 - accuracy: 1.0000
Epoch 08/100
1/1 [........................] - 0s 13ms/step - loss: 0.5850 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.5736 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.5624 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.5513 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 16ms/step - loss: 0.5404 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.5297 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 14ms/step - loss: 0.5193 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.5090 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 15ms/step - loss: 0.4990 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 16ms/step - loss: 0.4892 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.4796 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 14ms/step - loss: 0.4702 - accuracy: 1.0000
Epoch 09/100
1/1 [........................] - 0s 13ms/step - loss: 0.4610 - accuracy: 1.0000
1/1 [........................] - 0s 14ms/step
next word prediction for 'Deep Learning': 15
```

THANK YOU!

