

Project Report

Artificial Intelligence

Mentor - Dr. Atul Mishra

ChatGPT can change the world

By

Ridit Jain

210471

Ashi Jain

210451

Runishka Rao

210401



**BML MUNJAL
UNIVERSITY™**

FROM HERE TO THE WORLD

**Department of Computer Science and Engineering School of Engineering
and Technology BML Munjal University**

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Declaration by the Candidates

We hereby declare that the project entitled "**ChatGPT can change the world**" has been carried out to fulfill the partial requirements for completion of the core-elective course on Artificial Intelligence offered in the 5th Semester of the Bachelor of Technology (B. Tech) program in the Department of Computer Science and Engineering during AY-2023-24 (odd semester). This experimental work has been carried out by us and submitted to the course instructor **Dr. Atul Mishra**. Due acknowledgments have been made in the text of the project to all other materials used. This project has been prepared in full compliance with the requirements and constraints of the prescribed curriculum.

Ridit Jain

Ashi Jain

Runishka Rao

Place: BML Munjal University

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Introduction

- 1. Objective:** The goal of the undertaking is to investigate and break down the expected effect of ChatGPT on different areas of society and industry. It likewise means to investigate ChatGPT's usefulness, compositional plan, and high-level Natural language Processing (NLP) abilities. The goal is to comprehend what prompt engineering means for model execution and reaction exactness, and accordingly evaluate changing different fields potential.
- 2. Motivation:** The motivation driving this exploration is the quick progression of artificial intelligence and its rising coordination into day-to-day existence. To understand its advantages while moderating dangers, it is vital to comprehend how advancements like ChatGPT are utilized and the moral contemplations they present.
- 3. Significance:** This undertaking is significant on the grounds that it gives understanding into the groundbreaking capability of simulated intelligence models like ChatGPT. It features how this innovation can be an incredible asset to address complex difficulties, increase effectiveness, and set out new open doors in education, healthcare, business, and more. It likewise covers the specialized parts of computer-based intelligence language models and gives a profound comprehension of their true capacity and restrictions. By investigating ChatGPT's engineering and NLP technique, this study features mechanical progressions in artificial intelligence and its expected effect on business and society at large.
- 4. Novelty of the Study:** The uniqueness of this undertaking lies in the making of a custom informational collection for graphical analysis, which gives a novel approach to quantitatively assess ChatGPT's impact. This is supplemented by definite proof put together examination with respect to ChatGPT's worldwide effect across different areas. Moreover, this undertaking gives a useful comprehension of brief designing and is delineated utilizing genuine models ring and illustrated with real-life examples

Abstract

This project will direct a far-reaching evaluation of ChatGPT's groundbreaking expected in the realm of machine learning and AI. Through broad information assortment with members from BML Munjal University, we acquired important experiences into the genuine utilizations of ChatGPT and its apparent effect. Utilizing Google Structures for information assortment guaranteed an organized and proficient way to deal with diverse perspectives.

The premise of our examination is a progression of contextual analyses that give substantial proof of the viability of ChatGPT real-world efficacy. These case studies give a grounded outline of the effect of AI models in various situations and feature their reasonable worth. Besides, completely concentrating on the engineering and design of ChatGPT is a significant piece of our exploration.

This model's investigation of crucial computer-based intelligence and AI ideas overcomes any barrier between hypothetical information and genuine applications and features the intricacy and advancement driving ChatGPT. One more significant part of our task is investigating brief design utilizing ChatGPT.

By introducing models going from easy to complex, we show the way that inconspicuous information sources can immensely affect simulated intelligence results, and cautiously configuration prompts to deliver wanted reactions.

To understand these ideas, the task incorporates useful exhibitions with fundamental NLP models or chatbots. The reason for this involved experience is to naturally comprehend how a framework like ChatGPT functions and show simulated intelligence standards in real life. This task not just reveals insight into how exceptional artificial intelligence models like ChatGPT work, yet in addition shows extraordinary potential to reshape the way we interact with innovation.

Literature Review

1. ChatGPT fundamental applications and social impact

This paper features ChatGPT as a cutting-edge natural language handling innovation that empowers progressed human-machine communication and affects various fields. Use computer-based intelligence and AI in client support, voice associate, and interpretation applications to further develop correspondence productivity. In any case, challenges exist as far as exactness, preparing information predisposition, and control. In any case, ChatGPT is bringing issues to light of the capability of computer-based intelligence, working with culturally diverse correspondence, supporting business, and improving education, with its influence expected to grow.

2. Exploring Students' Perceptions of ChatGPT: Thematic Analysis and Follow-Up Survey

This study explores the impression of ChatGPT by understudies in the educational areas. that includes computer engineering students that previously assessed ChatGPT considering action and afterward finished a survey. They found ChatGPT motivating and helpful for learning and lauded its usability and human-like point of interaction. Nonetheless, concerns have been raised about precision and the requirement for background information. Even though students were hopeful about future enhancements, they affected learning and scholastic trustworthiness. The review infers that ChatGPT, while helpful, requires cautious use and attention to its impediments, and gives recommendation to instructors and designers to work on their instructive applications.

3. A Brief Overview of ChatGPT: The History, Status Quo, and Potential Future Development

This paper gives a comprehended outline of ChatGPT, artificial intelligence created content model created by OpenAI. It talks about the set of experiences, status, and potential future of ChatGPT, featuring its capacities in challenging language understanding and generation tasks. ChatGPT's center advances are featured, including enormous scope language models, learning in setting, and support gaining from human feedback. This paper perceives both the advantages and impediments of ChatGPT and accentuates the need to utilize it warily to stay away from potential dangers, for example, academic integrity and security issues. Finally, We talk about open issues and future advancement open doors for ChatGPT and recommend smart methodologies for its application in different fields.

4. From ChatGPT to ThreatGPT: Impact of Generative AI in Cybersecurity and Privacy

This paper focuses on the evolution of Generative AI (GenAI) models like ChatGPT and their implications in cybersecurity. It underscores the importance of understanding GenAI's consequences, particularly in terms of cybersecurity threats and privacy concerns. The study highlights the vulnerabilities of ChatGPT, showing how it can be exploited through techniques like jailbreaks, reverse psychology, and prompt injection attacks. It delves into how GenAI tools can be used for cyber offenses, including the development of social engineering attacks, phishing, and malware creation. Conversely, it also examines the use of GenAI tools for enhancing cybersecurity measures such as defense automation, threat intelligence, and malware detection. The paper concludes by emphasizing the need for a secure, safe, trustworthy, and ethical approach to GenAI, acknowledging the open challenges and future directions in ensuring its responsible use in the context of cybersecurity impacts.

5. Examining Science Education in ChatGPT: An Exploratory Study of Generative Artificial Intelligence

A generative AI article zeroed in on ChatGPT investigates its groundbreaking expected in

education, particularly in science. We look at how ChatGPT responds to instructive inquiries, its convenience in science training, and contemplations while involving it as an examination device. Even though ChatGPT's discoveries are frequently dependable with significant examination topics, the paper cautions of the risk of being taken as unquestionable epistemological authority without adequate evidence. Key moral worries incorporate natural effects, content balance issues, and the gamble of copyright encroachment. This study features the significance of capable use, decisive reasoning, and adjusting artificial intelligence assets to explicit instructive settings. Finally, it is recommended that ChatGPT might be an important instructive device that might invigorate further conversation about the job of generative AI in science education.

6. What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education

This study researches the job of ChatGPT in schooling and investigates its effect and difficulties through a qualitative case study. Public conversations via social media at first showed an uplifting outlook towards the utilization of ChatGPT in schooling, albeit some adopted a careful strategy. This study investigated the potential, nature of reaction, benefits, and moral issues of instructive change. Nonetheless, we have additionally uncovered issues connected with ChatGPT, including cheating, trustworthiness, security issues, and functional dangers. The outcomes recommend the requirement for cautious and capable execution of ChatGPT in instructive establishments and feature a few regions where future examination is expected to guarantee its protected and effective use.

Methodology

- **ChatGPT Definition**

ChatGPT is a chatbot powered by intelligence (AI) that employs natural language processing to generate dialogue that closely resembles human interaction. This advanced language model can provide answers to inquiries, create written materials such as articles, social media posts, essays, code snippets and emails.

1. Introduction to AI and Machine Learning

- **Basics of AI and ML**

- **Artificial Intelligence (AI):** AI refers to the imitation of human intelligence in machines that are programmed to think and learn. This is a more extensive idea wherein machines can perform tasks in a manner that is classified "smart".

- **Machine Learning (ML):** ML is a subset of computer artificial intelligence.
This is the study of computer algorithms that naturally work through experience and the utilization of data. This includes helping the computer learn from the training data and make decisions or predictions based on that learning.

- **Types of Machine Learning**

- **Supervised Learning:** This involves learning a function that maps an input to an output based on example input-output pairs. It infers a function from labeled training data consisting of a set of training examples.
- **Unsupervised Learning:** Unsupervised learning is used against data that has no historical labels. The system tries to learn the patterns and structure from the data without pre-existing labels.

- **Reinforcement Learning:** This is about taking suitable actions to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in a specific situation.

➤ **Coding Aspect**

- **Supervised Learning Example: Linear Regression**

This example uses the scikit-learn library to perform linear regression, a basic form of supervised learning.

```
from sklearn.linear_model import LinearRegression
import numpy as np

# Sample data (hours studied vs. exam score)
X = np.array([[5], [10], [15], [20]]) # Features (hours studied)
y = np.array([50, 80, 90, 95]) # Target values (exam score)

# Create and train the model
model = LinearRegression()
model.fit(X, y)

# Predict the score for someone who studied for 12 hours
predicted_score = model.predict(np.array([[12]]))
print(f"Predicted Score: {predicted_score[0]}")
```

- **Unsupervised Learning Example: Clustering with K-Means**

This example demonstrates clustering, a type of unsupervised learning, using scikit-learn.

```
from sklearn.cluster import KMeans
import numpy as np

# Sample data (could represent different data points)
X = np.array([[1, 2], [1, 4], [1, 0], [10, 2], [10, 4], [10, 0]])

# Apply K-Means clustering
kmeans = KMeans(n_clusters=2, random_state=0).fit(X)
```

```
# Predict the cluster for new data points
print(kmeans.predict([[0, 0], [12, 3]]))
```

- **Reinforcement Learning Example: Q-Learning (Pseudo-code)**

Reinforcement learning is more complex and often requires a more elaborate setup. Here is a pseudo-code example of Q-learning, a common RL technique:

Initialize Q-table $Q(s, a)$ arbitrarily

Observe the initial state s

Repeat (for each step in the episode):

Choose action a from state's using policy derived from Q (e.g., ϵ -greedy)

Act a , observe reward r , and next state's'

Update Q-table entry for $Q(s, a)$:

$Q(s, a) \leftarrow Q(s, a) + \alpha [r + \gamma \max_{a'}(Q(s', a')) - Q(s, a)]$

$s \leftarrow s'$ # Move to the next state until the episode ends

- **Real World Application**

- **Natural Language Understanding**, simulated intelligence, and ML empower ChatGPT to comprehend and decipher human language, permitting it to fathom client inquiries and give applicable reactions
- **Personalization and Contextualization**: AI calculations assist ChatGPT with customizing reactions considering client associations and keep up with setting during discussions, making cooperations seriously captivating and applicable.
- **Continuous Learning and Variation**: ChatGPT can ceaselessly gain from added information, guaranteeing it stays state-of-the-art and works on its presentation over the long run, making it an important and developing manufactured intelligence chatbot.

2. Generative Models in AI

➤ Generative vs Discriminative Models

- **Generative Models:** These models get familiar with the joint likelihood circulation $P(x,y)$. They can create added information occurrences. They can get familiar with the varieties and examples in the information to create added information focuses that look like the first information. Models incorporate GANs and Variational Autoencoders.
- **Discriminative Models:** These models get familiar with the contingent likelihood circulation $P(y|x)$. They are utilized for arrangement and expectation, zeroing in on recognizing various sorts of information occasions. Models incorporate Logistic Regression and Support Vector Machines.

➤ Generative Adversarial Networks (GANs)

- **Outline:** GAN comprises two sections: a generator and a discriminator. The generator makes manufactured information, and the discriminator assesses it. Generators attempt to deliver information that is indistinct from genuine information, while discriminators attempt to recognize genuine information and create information.
- **Generative Nature:** Claiming the discriminator is better at recognizing fakes, the generator learns over the long haul to create more sensible information. This ill-disposed process depends on the nature of the information delivered.

➤ Role in Data Augmentation

- **Data Augmentation:** GANs are especially helpful for information expansion and can produce newly manufactured information tests that are valuable for preparing AI models, particularly when how much genuine information is seriously restricted.

➤ Demonstrating a Simple GAN with Keras

- Making a GAN is a bit more confounding, yet here is some significant-level pseudocode that tells you the best way to set up a GAN to produce pictures. This is a worked-on guide to figure out the idea

```
from keras.models import Sequential
from keras.layers import Dense, Conv2DTranspose, Conv2D, Flatten, Reshape

# Generator model
generator = Sequential()
generator.add(Dense(256, input_dim=100, activation='relu'))
generator.add(Reshape((16, 16, 1)))
generator.add(Conv2DTranspose(1, kernel_size=4, activation='relu', strides=2, padding='same'))

# Discriminator model
discriminator = Sequential()
discriminator.add(Conv2D(64, kernel_size=3, activation='relu', input_shape=(32,32,1)))
discriminator.add(Flatten())
discriminator.add(Dense(1, activation='sigmoid'))

# Compile models
discriminator.compile(loss='binary_crossentropy', optimizer='adam')
discriminator.trainable = False # Freeze the discriminator during generator training

# Combined model
combined = Sequential()
combined.add(generator)
combined.add(discriminator)
combined.compile(loss='binary_crossentropy', optimizer='adam')

# Training loop (pseudo-code)
for epoch in range(num_epochs):
    # Generate fake images
    noise = np.random.normal(0, 1, (batch_size, 100))
    fake_images = generator.predict(noise)

    # Train discriminator
    discriminator.trainable = True
    d_loss_real = discriminator.train_on_batch(real_images, np.ones((batch_size, 1)))
    d_loss_fake = discriminator.train_on_batch(fake_images, np.zeros((batch_size, 1)))
    d_loss = 0.5 * np.add(d_loss_real, d_loss_fake)

    # Train generator
```

```
discriminator.trainable = False
g_loss = combined.train_on_batch(noise, np.ones((batch_size, 1)))

# Log the progress
print(f"Epoch: {epoch}, D Loss: {d_loss}, G Loss: {g_loss}")
```

➤ Real World Application

- **Data Augmentation:** GANs can expand preparing information by creating engineered discussions to work on the assortment and nature of reactions in talk based man-made intelligence models.
- **Enhanced Naturalness:** GANs can make artificial intelligence reactions more regular and human-like by copying subtleties of language, tone, and style, bringing about additional drawing in discussions.
- **Data Privacy and Anonymization:** GANs create protection safeguarding manufactured information for testing and advancement, guaranteeing client information stays safeguarded and agreeable with protection guidelines.

3. Deep learning and Neural network

➤ Deep Learning Overview

- **Deep learning**

A subset of machine learning in artificial intelligence that includes networks capable of unsupervised learning from unstructured or unlabeled data. Extract high-level functions from raw input step by step using multiple layers.

- **Importance in AI**

Deep learning is essential for tackling complex tasks such as image recognition, speech recognition, and natural language processing. It is particularly good at feature detection, which is essential for processing large and complex datasets.

- **Neural Networks**

These are the basics of deep learning. A neural network is a set of algorithms that attempts to discover underlying relationships within a data set through a process that mimics how the human brain works. A neural network consists of an input layer, a hidden layer, and an output layer.

- **Layers and Neurons**

Each layer consists of units or neurons that perform various calculations. The output of one level becomes the input of the next level.

- **Activation Functions**

These are mathematical equations that determine the output of a neural network. This function is associated with each neuron in the network and determines whether it should be activated (“fired”) or not.

- **Convolutional Neural Networks (CNNs)**

Convolutional neural networks are a category of neural networks that have proven to be highly effective in areas such as image recognition and classification. CNN can capture spatial and temporal dependencies in an image by applying relevant filters. Role in image recognition: This can be achieved by applying convolutional layers, pooling layers, and fully connected layers to process the data and extract features.

- **Coding Aspect**

```
from keras.models import Sequential
from keras.layers import Dense

# Create a Sequential model
model = Sequential()

# Add layers
```

```

model.add(Dense(units=64, activation='relu', input_dim=100))
model.add(Dense(units=10, activation='softmax'))

# Compile the model
model.compile(loss='categorical_crossentropy',
              optimizer='sgd',
              metrics=['accuracy'])

from keras.models import Sequential
from keras.layers import Dense

# Create a Sequential model
model = Sequential()

# Add layers
model.add(Dense(units=64, activation='relu', input_dim=100))
model.add(Dense(units=10, activation='softmax'))

# Compile the model
model.compile(loss='categorical_crossentropy',
              optimizer='sgd',
              metrics=['accuracy'])

```

```

from keras.models import Sequential
from keras.layers import Dense, Conv2D, Flatten

# Create a Sequential model
model = Sequential()

# Add convolutional layer
model.add(Conv2D(64, kernel_size=3, activation='relu', input_shape=(28,28,1)))

# Add another convolutional layer
model.add(Conv2D(32, kernel_size=3, activation='relu'))

# Flatten the output of the convolutional layers
model.add(Flatten())

# Add a fully connected layer
model.add(Dense(10, activation='softmax'))

```



```
# Compile the model
model.compile(optimizer='adam', loss='categorical_crossentropy', metrics=['accuracy'])
```

➤ Real time application with GPT

○ Visual Question Answering (VQA):

- CNNs can be joined with other profound learning models to empower chatbots to address inquiries concerning pictures. Clients can pose inquiries about the substance of the picture, and the chatbot examines the picture and replies in text.
- This is helpful in instructive chatbots where understudies can pose inquiries about pictures in course readings and other instructive materials.

○ Anomaly Detection in Visual Data:

- CNNs can be utilized to ceaselessly screen visual information streams, for example, you can utilize reconnaissance camera feeds or assembly processes. Chatbots can caution clients or make a move if they recognize oddities or uncommon examples in visual information.
- For example, if a security chatbot distinguishes uncommon conduct in a live camera feed, the chatbot can promptly tell security staff.

○ Emotion Detection:

- CNN can be utilized to examine pictures or video pictures continuously to distinguish the client's facial feelings. For instance, a chatbot can gauge a client's personal state in view of looks caught by a webcam or pictures transferred.
- This data can be utilized to tailor the bot's reaction and give compassion or backing likewise. For instance, if a chatbot identifies that a client is baffled, it can answer even more persistently or recommend an answer.

4. Reinforcement Learning in ChatGPT

➤ Reinforcement Learning Basics

- **Reinforcement Learning (RL):** Reinforcement learning (RL): Reinforcement learning is a type of machine learning in which an agent learns to make decisions to achieve a specific goal by operating in its environment. Agents are rewarded or punished for their actions. The goal is to learn the strategies and policies that produce the best results.

➤ Key Concepts:

- **Agent:** The learner or decision maker.
- **Environment:** The place where the agent learns and decides actions.
- **Action:** A set of decisions the agent can make.
- **Reward:** Feedback from the environment in response to an action.
- **Policy:** The strategy that the agent employs to determine the next action based on the current state.

➤ Fine-Tuning with RL in ChatGPT

- **RL in ChatGPT:** OpenAI uses a method called reinforcement learning with human feedback (RLHF) to improve ChatGPT. This involves multiple phases, from fine-tuning human interaction data to using human feedback to improve the model.
- **Human Feedback Alignment:** The human teacher takes responsibility for the environment and adjusts the accuracy and morality of the model's responses by providing rewards (positive feedback) or punishments (negative feedback) as appropriate. guarantees gender. Through this process, the model's responses align with people's values and expectations.

➤ Coding Aspect

```
import gym
import numpy as np

# Create the CartPole environment
env = gym.make("CartPole-v1")

# Initialize parameters
LEARNING_RATE = 0.1
DISCOUNT = 0.95
EPISODES = 1000

# For stats
ep_rewards = []
aggr_ep_rewards = {'ep': [], 'avg': [], 'min': [], 'max': []}

# Simple policy: if pole is falling to the right, move right; else, move left
def policy(state):
    pole_angle = state[2]
    return 0 if pole_angle < 0 else 1

for episode in range(EPISODES):
    state = env.reset()
    done = False
    episode_reward = 0

    while not done:
        action = policy(state)
        new_state, reward, done, _ = env.step(action)
        episode_reward += reward
        state = new_state

    ep_rewards.append(episode_reward)

    if episode % 10 == 0:
        average_reward = sum(ep_rewards[-10:]) / 10
        aggr_ep_rewards['ep'].append(episode)
        aggr_ep_rewards['avg'].append(average_reward)
        aggr_ep_rewards['min'].append(min(ep_rewards[-10:]))
        aggr_ep_rewards['max'].append(max(ep_rewards[-10:]))
        print(f"Episode: {episode}, average: {average_reward}, min: {min(ep_rewards[-10:])}, max: {max(ep_rewards[-10:])}")
```

```
env.close()
```

➤ Real time application

○ Enhancing Assistance in Specific Domains:

- ChatGPT can be adjusted using RL to function admirably in unambiguous regions or markets. For instance, support learning in client care chatbots can assist with further developing reactions by consolidating client input and further developing issue goals and client fulfillment.
- Real-time application: ChatGPT constantly gains from client connections to offer better help and inner arrangements. custom area.

○ Detecting Harmful or Unsafe Content:

- RL can further develop ChatGPT's substance and board abilities. Utilizing reinforcement learning, models can figure out how to perceive and keep away from negative, horrendous, and negative substances.
- Real-time application: ChatGPT proactively channels risky substances progressively to guarantee a protected and viable client experience.

Content Moderation and Ethical Response Generation:

- ChatGPT can utilize RL to guarantee that answers are made that satisfy moral and social guidelines. Human coaches can give criticism on replies, and learning backing can refine the model's responses to make them aware, fair, and just.
- Real-time application: ChatGPT may persistently refresh its reactions to maintain a conscious and legit discussion with the client.

5. ChatGPT and Intelligent Agents

➤ Intelligent Agents in AI

- **Definition:** An intelligent agent is a system that perceives its environment and takes actions that maximize the likelihood of achieving a goal. In AI, an agent is often a program or software that can perform autonomous actions to achieve a specific goal.
- **Components:** Intelligent agents typically include perceptual (awareness of the environment), cognitive (understands the environment and decides on an action), and action (performs the determined action) components.

➤ ChatGPT as an Intelligent Agent

- **Perception:** ChatGPT becomes aware of its surroundings through the information it receives. These ideas can be in the form of suggestions, questions, or comments from customers.
- **Cognition:** After receiving input, ChatGPT processes it using a deep learning model. Understand your content, identify your users' goals, and determine the best response based on your training.
- **Action:** ChatGPT is working to create consistent responses and content. This action is the result of a complex calculation and decision-making process that occurs within the neural network

➤ ChatGPT and Expert Systems

- **Expert Systems in AI**
 - **Definition:** An expert system is a computer that simulates the decision-making ability of a human expert. It is designed to solve complex problems by thinking through a body of knowledge, often expressed in the form of rules, rather than in a traditional way.

- **Components:** Expertise includes a knowledge base (sufficient knowledge about a particular domain) and a reasoning engine (applying knowledge to a particular situation).

○ **ChatGPT's Relation to Expert Systems**

- **Knowledge Base:** ChatGPT's information system is based on its own knowledge base. He has valuable information about many countries from the books he studied. However, unlike professional methods, the information in ChatGPT is not in the form of if-then rules, but rather in the form of patterns learned from the data.
- **Inference:** ChatGPT uses its own neural network for inference. The machine is not used normally, but like inference, inferences are made based on the patterns and relationships learned during training.

➤ **Application in Real-World Scenarios**

In practical applications, ChatGPT can fill in as a wise specialist and expert. For instance, in client support, he can collaborate with clients by utilizing himself (the specialist job) and give explicit counsel or answers in view of his preparation (the expert job).

ChatGPT Impact

A. Education

➤ Positive impact

○ Improved Communication and Learning

ChatGPT can be used as a tool for students because it can generate answers to students' questions. This is especially important when working on content or searching for information on a certain topic. For example, students can rely on ChatGPT to improve their understanding of difficult topics or gain deep academic knowledge.

○ Boosted Creativity

One of the features of ChatGPT is the ability to produce creative writing. Students can use this feature to explore their talents in many areas, including storytelling, poetry, writing, and even music composition. ChatGPT serves as a companion for students who want to express themselves in imaginative ways.

○ Personalized Learning

ChatGPT has the potential to personalize the learning experience for students by providing feedback on their work and suggesting resources. This personalized approach helps students tailor their learning journey to their needs and interests, supporting effective learning outcomes and enabling them to reach their full potential.

➤ Negative Effects

○ Loss of Critical Thinking

If students use ChatGPT to get all the answers, they will not be able to develop the thinking and problem-solving skills of traditional education.

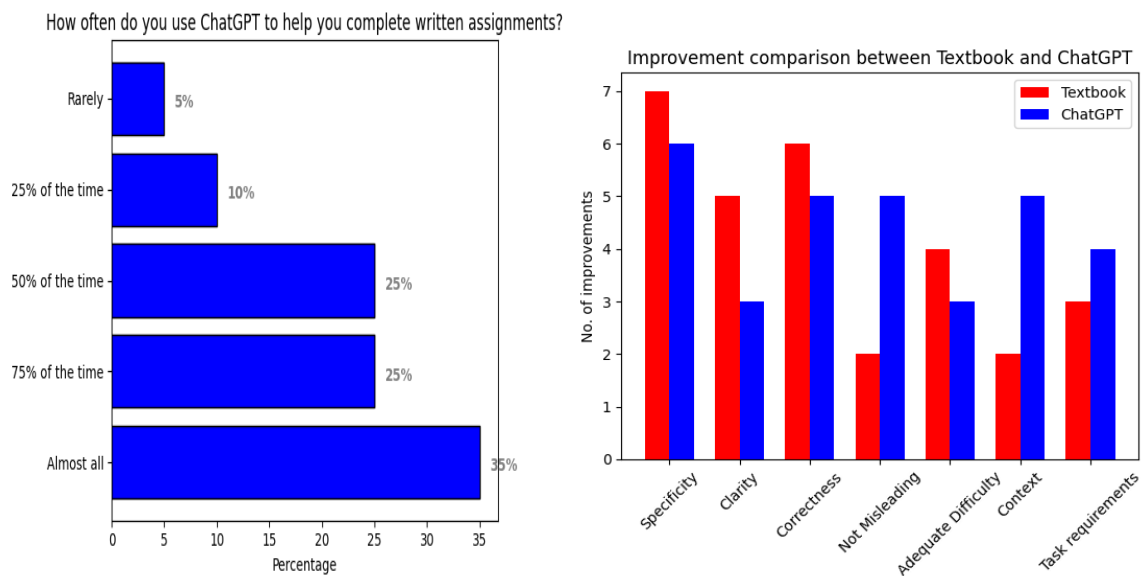
○ Misinformation

Another disadvantage of using ChatGPT is the possibility of displaying error messages. Students should be careful. Please verify the accuracy of the information generated by

ChatGPT before relying on it for research. It is important to make your own judgment and verify the information you receive from ChatGPT to ensure that it is reliable and trustworthy.

- **Academic Integrity Concerns**

Visit ChatGPT Helpful information on academic integrity issues is available. Students may tend to use ChatGPT to cheat on tests or assignments by inventing answers or completing assignments. Participating in practice does not prevent real learning but promotes vicarious learning.



Use of ChatGPT for Assignments Use of Textbook vs ChatGPT

B. Health Care

- **Positive Impact**

- **Virtual assistance**

ChatGPT eases the transition to health care for home assistants who can book personal sick appointments, assist with patient care, and manage medical records.

- **Telemedicine Support**

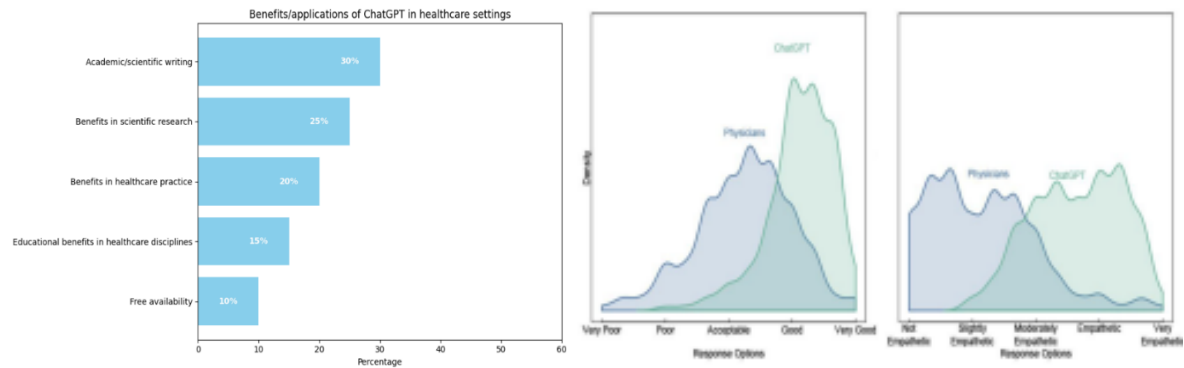
- **Remote Consultations:** ChatGPT can support the consultation by gathering medical history, assisting with initial assessment, and providing relevant information for the doctor's initial virtual appointment.
 - **Post-Consultation Follow-ups:** Also used for post-consultation follow-up to monitor the patient's progress, provide additional information, and address questions that arise later in the consultation.
- **Health Information and Education**
 - **24/7 Access to Information:** ChatGPT allows you to access medical information and get answers to questions about your condition, treatments, and lifestyle.
 - **Health Education:** May facilitate education by detailing treatment plans and lifestyle changes based on patient preferences.
 - **Clinical Decision Support**

ChatGPT supports healthcare professionals by providing clinical and advice-based information. This will help you decide.
 - **Negative Impacts**
 - **Incorrect Responses**

If users only trust AI without verifying it, they run the risk of providing harmful information or advice.
 - **Data Security**

The handling of health information raises concerns about data security and data protection. You must take steps to protect user data.
 - **Reduced Personal Interaction**

Relying solely on AI for medical interactions can eliminate the delicate touch and relationships that are often important in inpatient care.



Benefits of ChatGPT in Healthcare ChatGPT Outperforms Physicians to Patient Questions

C. Business

➤ Positive Impacts

○ Efficiency and Productivity

ChatGPT allows you to complete time-consuming tasks, such as answering frequently asked customer questions or creating reports, without causing fatigue. This allows employees to focus on strategic tasks that drive innovation and growth.

○ Cost Reduction

By automating tasks traditionally performed by employees, businesses can reduce labor costs, while ChatGPT's ability to complete tasks at the same time frees up workforce in areas such as customer support. dependence is reduced.

○ Customer Support and Engagement

ChatGPT-based chatbots provide round-the-clock support and ensure customers get help whenever they need it. Consistent responses and quick resolution of inquiries contribute to increased customer satisfaction and loyalty.

○ Personalization

Artificial intelligence can analyze customer data, such as browsing history and purchase records, and make product recommendations. This personalized approach tends to increase sales because customers are more likely to buy when offered.

- **Data Analysis:**

Artificial intelligence excels at processing copious amounts of data, uncovering patterns and trends that humans may not notice. Businesses can use these insights to make data-driven decisions, optimize marketing strategies, and improve operations.

- **Negative Impacts**

- **Job Displacement**

The introduction of artificial intelligence and automation can potentially lead to job displacement in industries dominated by routine tasks. To address this, businesses may need to provide employees with retraining or upskilling opportunities that allow them to move into roles while AI handles repetitive functions.

- **Data Privacy and Security**

Managing large volumes of customer data for analysis and interactions with artificial intelligence can pose risks to the privacy and security of that data. It is critical for businesses to be aware of the damage a data breach or misuse can cause to their reputation, as well as the legal and financial consequences they may face.

- **Depersonalization**

While AI can offer recommendations and support, there is concern that customers may feel disconnected or missing certain elements in certain interactions. Achieving a balance between automation and human interaction is vital to maintaining a positive customer experience.

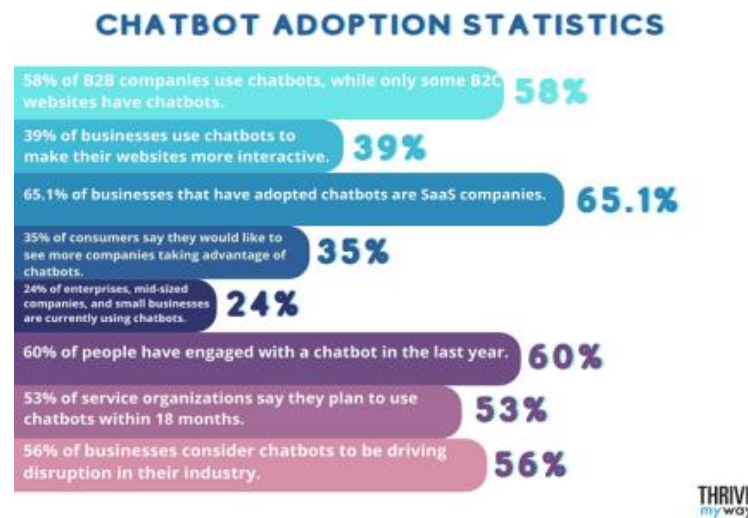
- **Technical Challenges**

Implementing and managing AI systems can be complex and require investment in technology and training. Ongoing maintenance is necessary to keep AI systems running while adapting to evolving business needs.

- **Ethical Concerns**

AI systems like ChatGPT have the potential to perpetuate biases in their training data, which is a concern, especially in areas such as hiring or hiring decisions. Businesses must prioritize

development practices for AI by incorporating fair and unbiased training data to mitigate these issues and maintain trust with customers and stakeholders.



ChatGPT Adoption Statistics in business

D. Programming and Developing

➤ Positive Impacts

○ Assistance with problem-solving

ChatGPT helps you brainstorm ideas, solve problems, and find solutions to your coding problems. You can provide explanations, provide code examples, and suggest improvements to the code.

○ Code generation

ChatGPT provides the ability to generate code snippets or complete programs based on your requirements, saving you valuable time and effort that you would have to spend writing code from scratch.

○ Learning and education

ChatGPT serves as a tool to effectively learn programming and understand coding concepts. He is good at explaining topics in an easy-to-understand manner.

- **Efficiency**

ChatGPT helps with tasks such as code documentation, code reviews, and code refactoring to streamline the coding process and increase efficiency.

- **Negative Impacts**

- **Limited understanding**

ChatGPT may not fully capture the context of a coding problem, resulting in inaccurate or irrelevant suggestions. Lack of creativity, unlike an understanding developer ChatGPT can provide solutions within the framework of training data but lacks the mindset and innovative approach that a human developer brings to his task of coding There is a possibility.

- **Lack of creativity**

While ChatGPT is proficient at providing solutions within the scope of its training data it may lack the thinking and innovative approaches that human developers bring to coding tasks.

- **Debugging challenges**

Debugging certain issues with ChatGPT can be difficult because ChatGPT may not accurately reproduce the environment or conditions that cause the error.

- **Security concerns**

ChatGPT may incorrectly suggest insecure or vulnerable code based on training data, creating a security risk to your application.

- **Lack of real-world experience**

ChatGPT lacks practical experience. It cannot provide any insight from actual development practice.

E. Content

- **Positive Impacts**

- **Efficiency**

ChatGPT can be used to generate content, saving time and energy during the creation process.

- **Idea generation**

Helps you brainstorm and develop ideas for articles, blog posts, or other types of content.

- **Improved consistency**

One of the benefits of using ChatGPT is the ability to maintain a consistent tone, style, and voice throughout your content. This is especially important to establish your brand identity and attract readers.

- **Research assistance**

ChatGPT is a resource for conducting research and fact-checking by providing background information and explanations on topics.

- **Negative Impacts**

- **Lack of originality**

While ChatGPT is good at creating content quickly, it may not match the creativity and originality that writers bring to their work. Therefore, it is possible to create duplicate content.

- **Inaccuracies**

Be careful when relying solely on ChatGPT answers as they are based on their own knowledge. This information may not be current or completely accurate. That is why fact checking is important.

- **Limited understanding**

Failure to understand ChatGPT may mean not understanding all the nuances of some topics, resulting in content lacking depth or understanding.

- **Plagiarism concerns**

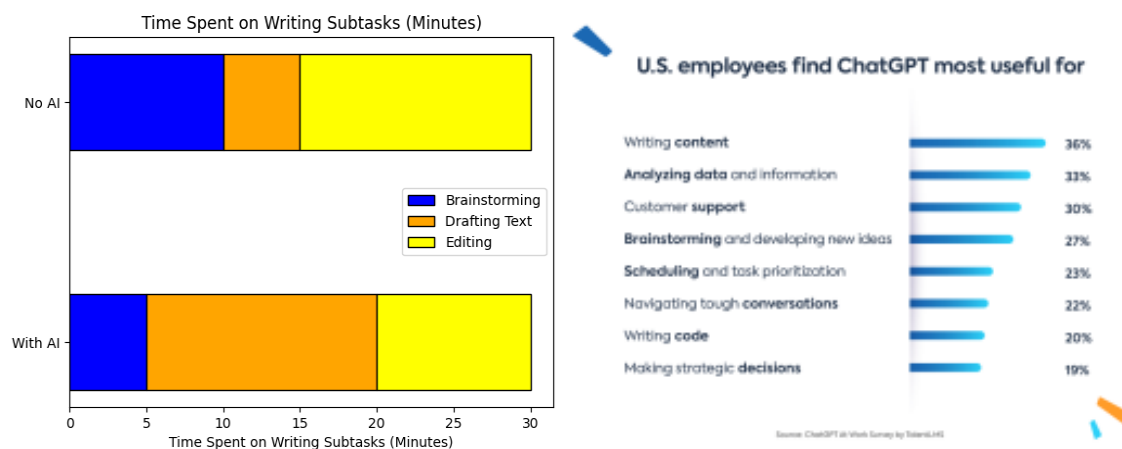
ChatGPT Accidentally created content may be like or duplicate existing content, which can lead to plagiarism issues.

- **Editing required:**

Content generated by ChatGPT often requires human editing and refinement to ensure it meets quality standards, which can reduce the expected time savings.

- **Loss of delicate touch**

When using AI to write content, there is a risk of losing touch and connection with the author, potentially affecting reader engagement.



Stats of time spent on doing task and how US employees use ChatGPT

Case Study

1.ChatGPT in 1MG

➤ What did AI do

- **AI-Powered Chatbots using ChatGPT-** Patients can get instant answers to their questions, which reduces wait times, Users can upload prescriptions, and AI helps decipher drug and possible generic substitutes by suggesting products, the bot provides reliable information. Drugs, side effects, and interactions. (NLP, Transformers)
- **Disease Prediction Models-** Using AI models, 1mg predicts potential diseases based on symptoms and helps users understand urgency (ML Models)
- **Medicine Recommendation Systems-** AI algorithms analyze user data and prescriptions to provide essential information Recommendations Medications (Deep Learning-Based Recommendations)
- **Bookings:** Limited access to doctors Locally, 1mg offers telephone consultations. AI tools can help streamline the process, from booking an appointment to writing a prescription.

➤ Results:

- Response time: 15 minutes to 30 seconds (chatbot)
- Prescription errors = 5% to 0.5D44
- User interaction: 5 to 12 minutes
- Appointments = 10pm to 5pm

2.ChatGPT in Healthian

➤ **What did AI do**

- **Automated Customer Service-** Use ChatGPT to respond to patient questions, schedule appointments, and provide health-related information.
- **Personalized Health Recommendations-** Use AI to analyze patient data and create personalized nutrition, fitness, and health recommendations.
- **Diagnostic Assistance-** AI tools can help interpret medical images and test reports, speeding up the diagnostic process and reducing the workload of healthcare professionals.

➤ **Results:**

- Response time: reduced from 15 minutes (before AI) to 2 minutes (after AI).
- Diagnostic accuracy: improved from 80% to 95% with AI-assisted diagnosis.
- Patient Load Handling: Increase the number of patients managed per day from one hundred (before AI) to three hundred (after AI).
- Patient satisfaction: satisfaction increased from 70% to 90% after implementing AI.

Prompt Engineering

Prompt Engineering refers to the art of creating questions and instructions to obtain the best

possible answers from an AI language model. This is an important skill because the quality of your input (prompts) affects the quality of your output. This involves understanding the nuances of a model's language processing capabilities and using them effectively. Discuss the following strategies for designing effective prompts: Specificity, clarity, and context awareness.

How to Engineer your AI Prompts?

The quality of the prompt is especially important. There are ways to improve these and improve the model results. Let us look at some tips below:

- **Role Playing:** The idea is to make the model function as a specified system. This creates customized interactions and achieves specific results. This saves time and complexity while still producing impressive results. This may include serving as a teacher, code editor, or interviewer.
- **Clearness:** If you try to express it in detail, you may end up including unnecessary content. A wonderful way to do this is to keep your content concise.
- **Specification:** This is related to role-playing games, but the idea is to lead in a concrete and rational direction. This avoids output dispersion.
- **Consistency:** Consistency means keeping the conversation flowing. Maintain a consistent tone to make the conversation easier to read.

Elements of a Prompt

These are the attributes that make up the skeleton of prompts. These can be:

- **Instruction:** It is an assertion entrusting the model to perform something.
- **Context:** Setting smoothest out the model to the issue. If not, it can go all the way wrong and give unfortunate reactions.
- **Input Data:** It is the contribution overall single element.
- **Output Indicator:** In pretending, it shows the sort of result which will be a code. This component helps the model channel yield appropriately.

Prompting techniques

There are many different techniques on how we can write prompts. They are as follows

1. Zero-Shot Prompting

Zero Shot provides prompts that are not part of the training but work as intended. In other words, LLM can be generalized.

- Description: Zero-shot prompting involves presenting a task or question to a language model without providing specific examples or context. The model must rely on general understanding and training to respond.
- Example prompt: "Write a guide on how to care for a pet dragon."
- Result: The model was trained specifically to care for mythical creatures such as dragons. No, but use that general understanding to create a reasonable care guide

2. Few-Shot Prompting/ In-Context Learning

On understanding, a few shots use several examples (shots) of what needs to be done. Implementation requires insights gained from demonstrations. It builds on the strokes available, rather than relying solely on training content.

- Description: Few-Shot-Prompt provides the model with several examples (shots) of the desired output or task. These examples help the model understand what is expected in the response.
- Example prompt:
 - "Example 1: Question: What is the capital of France?" Answer: Paris.
 - "Example 2: Question: Who wrote 'Hamlet'? Answer: William Shakespeare."
 - "Next question: What is the boiling point of water? Answer: "

- Result: By analyzing the structure and answer of the given example, the model can answer new questions in a similar format. learn.

3. Chain-of-thought (CoT)

CoT allows models to achieve complex reasoning through immediate reason steps. This involves creating and maintaining immediate steps called “arguments” to facilitate language understanding and conversion. This could be hybrid that combines different shooting methods are more complex missions.

- Explanation: A thought leads the intellectual mind to reach a decision by going through the steps of reasons or reasons. This method is particularly suitable for complex tasks that require intermediate steps or explanations.
- Example sentences: “When deciding whether to bring an umbrella today, consider the weather forecast and the chance of rain. If the weather forecast indicates there is a chance of rain, you should bring an umbrella. According to today's forecast, there is a 70% chance of rain. Should I bring an umbrella? ”
- Result: The pattern corresponds to the description in the instructions. Review the weather information provided and use the steps to determine if it will rain and if you should bring an umbrella.

What to Avoid When Creating Prompts?

Before we summarize, here are some things to avoid when creating prompts.

- Information Overload(ambiguity): Try to provide as concise information as possible as information can be wasted and affects the accuracy of the result.
- Open-ended Questions: we recommend that you avoid asking vague or open-ended questions. A vague question may be “ Can you help me find my way home?” they are general rather than specific, leading to inaccurate and unimaginative answers.
- Inappropriate Use of Constraint: Constraints are limit and restricted on how distributed a situation is . this requires specifying certain requirements. This may include a model to play a role.

Examples

○ **Multifaceted Analysis:**

- Simple Prompt: " Give an example of the impact of COVID-19.
- Engineered Prompt: "Explain the impact of COVID-19 on business in the global supply chain, focusing on technology Industry and past business in East Asia We presented our support strategy based on returns."."
- Outcome: AI provides detailed analysis focusing on global technologies and products as well as historical context history and ideas. advice.

○ **Creative Writing with Constraints:**

- Simple Prompt: " Write an apocalyptic story.
- Engineered Prompt: " From a point of view set in a post-apocalyptic world where nature has reclaimed its major cities." Author a short story to be told"
- Outcome: The AI creates a unique and vivid story while adhering to specific thematic and stylistic specifications.

○ **Technical Explanation with Application:**

- Simple Prompt: " Compare machine learning."
- Engineered Prompt: " "Teach the fundamentals of machine learning algorithms (especially neural networks) and discuss their use to develop Environmental "
- Outcome: Artificial intelligence enables the interpretation of neural networks and the creative use of this information for the sustainability of the urban environment.

○ **Historical Analysis with Present-Day Comparison:**

- Simple Prompt: " "Describe the decline of the Roman Empire. "."
- Engineered Prompt: " Compare the political and social dynamics of the Roman Empire during its decline with current global political trends, focusing on governance and social structure. "."
- Outcome: AI provides a comparative analysis that connects ancient history and contemporary politics, offering insights into both periods.

○ **Creative Problem Solving in Business:**

- Simple Prompt: Business ideas for online training."
- Engineered Prompt: Consider a start-up company specializing in virtual reality training. We have prepared a business strategy Specific business technology planning and A model to bridge the gap in online education, including technological development."
- Outcome: Artificial intelligence is a new business model, and its business ideas and technology are focused on the workplace designed for virtual reality teaching.

○ **Integrating Philosophy and Technology:**

- Simple Prompt: " "Ethics in AI.""
- Engineered Prompt: " "With reference to Kantian and utilitarian theories, what are the ethical implications of AI in decision-making and how do they influence ethics?"
- Outcome: AI provides a thoughtful discussion of AI ethics, integrating philosophical theory to provide depth and context.

○ **In-Depth Policy Proposal:**

- Simple Prompt: " Renewable energy in developing countries."
- Engineered Prompt: " Renewable energy in developing countries, taking into account socio-economic and technological aspects"
- Outcome: AI creates detailed policy proposals that address the complexities of renewable energy deployment in developing countries.

○ **Complex Recipe Creation with Constraints:**

- Simple Prompt: " Vegetarian feast recipe."
- Engineered Prompt: " Make a recipe for a full vegetarian feast reasonable for gluten prejudice and nut sensitivities, including Mediterranean fixings, appropriate for home cooks with restricted hardware."
- Outcome: The simulated intelligence plans a customized full vegetarian feast, considering dietary limitations and explicit cooking impacts, functional for home planning.

NLP Code

```
# for speech-to-text
import speech_recognition as sr
# for text-to-speech
from gtts import gTTS
# for language model
import transformers
import os
import time
# for data
import os
import datetime
from transformers import AutoModelForCausalLM, AutoTokenizer

import numpy as np
# Building the AI
class ChatBot():
    def __init__(self, name):
        print("----- Starting up", name, "-----")
        self.name = name
        self.tokenizer = AutoTokenizer.from_pretrained("bert-base-uncased")
        self.model = AutoModelForCausalLM.from_pretrained("bert-base-uncased")
    def speech_to_text(self):
        recognizer = sr.Recognizer()
        with sr.Microphone() as mic:
            print("say anything.....")
            audio = recognizer.listen(mic)
            self.text="ERROR"
        try:
            self.text = recognizer.recognize_google(audio)
            print("Me --> ", self.text)
        except:
            print("Me --> ERROR")
    @staticmethod
    def text_to_speech(text):
        print("Runishka --> ", text)
        speaker = gTTS(text=text, lang="en", slow=False)
        speaker.save("res.mp3")
        statbuf = os.stat("res.mp3")
        mbytes = statbuf.st_size / 1024
        duration = mbytes / 200
        os.system('start res.mp3') # if you are using mac->afplay or else for windows->start
```

```

    # os.system("close res.mp3")

    time.sleep(int(50*duration))
    os.remove("res.mp3")
def wake_up(self, text):
    return True if self.name in text.lower() else False
@staticmethod
def action_time():
    return datetime.datetime.now().time().strftime('%H:%M')
def analyze_sentiment(self, text):
    sentiment_analyzer = pipeline("sentiment-analysis")
    sentiment = sentiment_analyzer(text)
    return sentiment[0]['label']

# Running the AI
if __name__ == "__main__":
    ai = ChatBot(name="Runishka")
    nlp = transformers.pipeline("conversational", model="microsoft/DialoGPT-medium")
    os.environ["TOKENIZERS_PARALLELISM"] = "true"
    ex=True
    while ex:
        ai.speech_to_text()
    ## wake up
        if ai.wake_up(ai.text) is True:
            res = "Hello I am Runishka Rao, created by Redit Jain, what can I do for you?"
    ## action time
            elif "time" in ai.text:
                res = ai.action_time()
    ## respond politely
            elif any(i in ai.text for i in ["thank", "thanks"]):
                res = np.random.choice(["you're welcome!", "anytime!", "no problem!", "cool!", "I'm here if you need me!", "mention not"])
            elif any(i in ai.text for i in ["hello", "hi", "hey"]):
                res = np.random.choice(["Hi, What is up", "Hello there", "Hi, I am Runishka, How can ihelp", "Hi, hope you are having a great day"])
            elif any(i in ai.text for i in ["exit", "close"]):
                res = np.random.choice(["Tata", "Have a good day", "Bye", "Goodbye", "Hope to meet soon", "peace out!"])
                ex=False
    ## conversation
        else:
            if ai.text=="ERROR":
                res="Sorry, come again?"
            else:
                chat = nlp(transformers.Conversation(ai.text), pad_token_id=50256)

```



```
res = str(chat)
res = res[res.find("bot >>")+6:].strip()
ai.text_to_speech(res)
print("----- Closing down Runishka -----")
```

Discussion

➤ **What have we done so far?**

To evaluate the impact of ChatGPT, we collected data using Google Forms with participants from Saraswati High School and BML Munjal University. We support our review with case studies that prove the effectiveness and efficiency of ChatGPT. These research articles provide insight into the true impact of your designs.

Detailed study of ChatGPT architecture and design as part of our research. We took a deep dive into the various AI and machine learning concepts built into ChatGPT and connected them to real-world applications. To learn more about how ChatGPT works, we examine the concept of hint engineering. This section includes several simple model examples that show how clever ideas can change ChatGPT results.

Finally, the project offers a demonstration through simple NLP models or chatbots. This performance is designed to provide a visual understanding of how systems like ChatGPT work and explain how intelligence works.

➤ **Implications for future research and applications:**

Potential areas for future research on ChatGPT have been identified. Discuss how contemporary trends in AI and NLP may impact the development of models like ChatGPT. Consider ethical issues such as privacy and data security.

➤ **Limitations**

NLP models are too simple to be used for advanced tasks.

The scope of data collection is narrow and the type of research is limited.

Future research will consider best architecture strategies, perform an in-depth architectural analysis of ChatGPT, and explore application strategies of NLP models in many different and complex real-world situations. It is possible to expand this.

Conclusion

In conclusion, our project focuses on ChatGPT's impact on artificial intelligence and machine learning. The positive response and interest from participants at Saraswati College and BML Munjal University show that there is a growing desire to incorporate ChatGPT and other AI technologies into all occupations.

From the case study, we can show many features of ChatGPT and how it can improve performance. Examples from this world demonstrate not only the potential but also future success in AI applications. By exploring ChatGPT's architecture, you can gain a deeper understanding of its intelligent concepts. Understanding these principles is key to managing new and improved interactions with AI systems.

We emphasize the importance of technology and how user input influences the results generated by artificial intelligence systems. This understanding plays a key role in the effective implementation of artificial intelligence technology. Finally, we demonstrated the use of NLP models to demonstrate the real use of cognitive models by making complex concepts understandable and engaging.

Overall, our research demonstrates the potential of ChatGPT as a driver for greater cognitive development. As technology continues to evolve, ChatGPT is poised to advance technology and expertise and play a role in shaping a future where intelligence can drive interactions in everyday life.

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