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EXPLORE TO INVENT

CMRIT B.Tech Lab Record

CSE(AI&ML) / CSE(DS) / AI&ML / CSE(CS)

Automated Writing Tools - ChatGPT Lab

III - Year / I - Sem

SPECTRUM®

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CMR INSTITUTE OF TECHNOLOGY

(UGC AUTONOMOUS)

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Kandlakoya, Medchal Dist. - 501 401
www.cmrithyderabad.edu.in

DEPARTMENT OF

____

CERTIFICATE

ACADEMIC YEAR: 20___ - 20___

This is to certify that the bonafide record work done by Mr./ Ms. Harsika velkanda
________________ bearing H.T. No. 22R01A7362 of
III B.Tech, ________ I Semester in the Automated writing tools chatGPT. laboratory
is satisfactorily completed.

Faculty In-charge

Course Coordinator

External Examiner

Experiment-1

Conduct a Mock-interview

Date: 2/8/24

AIM

Conduct a mock-interview

PROCEDURE

To create a mock-interview

Step-1: Interview Context

Step-2: Role or Position

Step-3: Focus Areas

Step-4: Define the Objectives

Step-5: Set Up the Environment

Step-6: Implement Feedback

SOURCE CODE

prompt 1: Conduct a Mock Interview to me on Software testing fresher role. please do not show any But rate my answer and give feedback whether you would like to hire me to the Job or not.

prompt 2:

Ask me 2 Questions. one after another 1 answer. first question on testing. 2nd question on HR give me feedback whether I am Selected for interview or not.

prompt1 answer: Question 1: can you Explain that what software testing is and why it is importent

(You can respond, and then I'll provide feedback.)

The process of assessing the functionality of a software progra

Feedback: your answer is brief and captures the essence of software testing, but it's quite basic. while it's correct that software testing involves assessing functionality, you could enhance your response.

rating: 5/10

prompt2 answer: Question1 (technical) what is the differe between white box testing and white-box-testing?

Black box and white box testing are both software-testing methodologies that differ they approach-testing

Expanding on these points would show a stronger understanding

Rating: 4/10

OUTPUT

1) How good are you in listening skills?

2) What are your strengths?

3) What are your hobbies?

4) Where do you see yourself 5 years down the line?

5) What is your Expected salary?

6) Describe about you in 2 minutes?

7) What was your project about?

8) What is your role in your project?

9) What makes you get frustrated?

10) Did you prepare for the interview before attending?

11) What is your mode of transport to come to office?

12) Tell me about your family?

13) How soon would you like to join the job?

14) Tell me about your technical skills.

VIVA QUESTIONS

1. Tell me about myself.

Ans. I'm currently a B.Tech student specializing in artificial intelligence and machine learning at CMR institute of technology. I have a strong interest in software testing.

2. Why I'm leaving my current company?

Ans. I'm seeking new opportunities to grow and advance my career

3. What are the top questions hiring managers ask for a project manager in tech industry for a mid sized company?

Ans. 1) Can you describe a recent project you managed?
2) How do you prioritize and manage multiple projects?
3) How do you handle changes in project scope?

4. What type of questions will ask for fresher Tech position?

Ans. 1) How do you approach learning new Tools?
2) What do you understand about test?
3) What interests you about this particular role?

5. Based on my resume can you give me answers for each of the 10 questions?

Ans.

Experiment-2

Simulate of a Bunch of Helium Molecules

Date: 16/08/2024

AIM

Simulate of a Bunch of Helium Molecules.

PROCEDURE

we'll consider the following assumptions and simplifications:

Step-1: Helium atoms are treated as hard spheres.

Step-2: Interactions between atoms are modeled using a simple Lennard-Jones potential.

Step-3: Periodic boundary conditions are used to simulate an infinite system.

SOURCE CODE

Example prompt: create a physical simulation in java script of container full of gas molecules the molecules should be simple diatomic helium gas molecules. also in addition to collision physics also add corrections for van der waals forces and apply distortion to the molecules based on these forces

prompt: create a simple 2D demonstration of the above in java script to the level of complexity that you can code

prompt: using the mass of the helium nucleus, and the speeds of the gas molecules, have label that outputs the temperature of the box at any instant. use statistical machines{mechanics} to calculate the temperature

prompt: update above code to add the label in html below the gas container. to the right of the gas container have a small box that explains the kinetic theory of gases and have the relevant equation below it

prompt: merge all the code into a simple [single] HTML file

Source code:

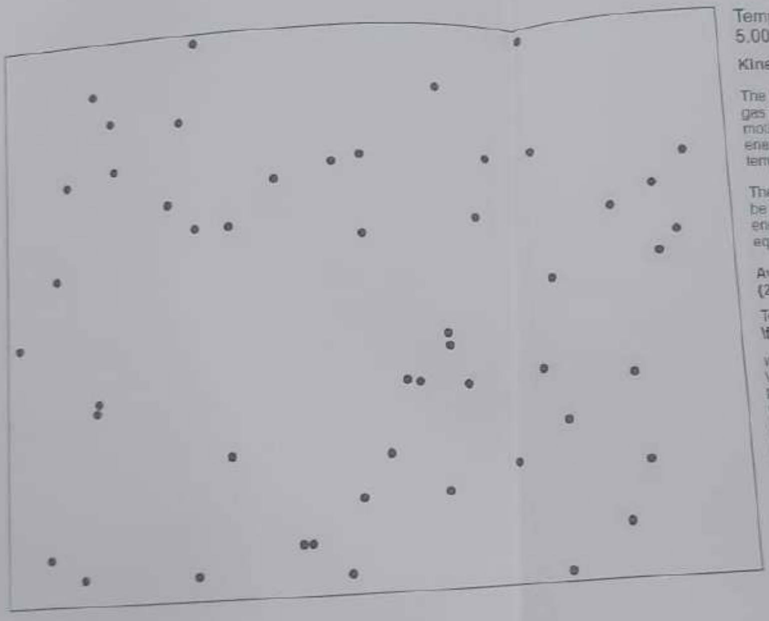
```
<!Doctype html>
<html lang="en">
<head>
 <meta charset="UTF-8">
<meta name="viewport' content='width=device-width,initial-
                              scale=1.0">

<title>2D Gas Molecule Simulation </title>

<Style>
 body {display: flex; flex-direction: column; justify-content:
 Center; align-items: center; height: 100vh; margin: 0;}
 Canvas{border: 1px solid black;}
#container {display: flex;}
#temp {margin-top: 10px; font-size: 18px;}
#info {margin-left: 20px; padding: 10px; border: 1px
 solid black; background: #f9f9f9; max-width: 300px;}
</style>
</head>
<body>
<div id="container">
<canvas id="simulation canvas' width="800" height="600"></canvas>
<div id="info">
<h3> Kinetic theory of gases </h3>
<p> Temperature \(T\) is given by:</p>
<p>\[T = \frac{2 \text{KE} - {\text{avg}}}{3 k-B} \]</p>
```

```
</div>
</div>
<div id="temp"> Temperature: Calculating...</div>
<script>
 const canvas = document.getElementById('simulationCanvas'), ctx =
 canvas.getContext('2d');
  const mols = Array.from({length: 50}, (_)=> ({x: Math.random()*
  canvas.width, y: Math.random()*canvas.height, vx: (Math.random()
 -0.5)* 4, vy: (Math.random()-0.5)*4}));
  const m=4.002602e-27, K-B = 1.38e-23, r=5, vdM = 10;
  function update(){
  ctx.clearRect(0,0, canvas.width, canvas.height);
  mols.forEach(mol => {mol.x += mol.vx; mol.y += mol.vy; if(mol
  .x < r || mol.x > canvas.width - r) mol.vx *= -1; if (mol.y < r || mol.
  y > canvas.height - r) mol.vy *= -1; c
  ctx.beginPath(); ctx.arc(mol.x, mol.y, r, 0, 2 * Math.PI); ctx.fill();});
  mols.forEach((m1, i) => mols.slice(i+1).forEach(m2 => {const dx =
  m1.x - m2.x, dy = m1.y - m2.y, d = Math.sqrt(dx**2 + dy**2); if
  (d < 2*r + vdW) {const O = (2*r + vdW - d)/2; m1.vx -= O*dx/d;
  m1.vy -= O*dy/d; m2.vx += O*dx/d; m2.vy += O*dy/d;}}));
  const T = 2*mols.reduce((a, mol) => a+0.5*m*(mol.vx**2 + mol
  .vy**2), 0)/ (mols.length * 3*K-B);
  document.getElementById('temp').textContent = `temperature: ${T.toFixed
  (2)}K`;
  requestAnimationFrame(update);
  }
  update();
</script>
</body>
</html>
```

OUTPUT



Temperature:
5.007260204784807e+21 K

Kinetic Theory of Gases

The kinetic theory of gases explains that gas molecules are in constant random motion and that their average kinetic energy is directly related to the temperature of the gas.

The temperature \(T \) of an ideal gas can be calculated from the average kinetic energy of its molecules using the following equations:

Average Kinetic Energy: \(KE = \frac{1}{2} m v^2 \)

Temperature: \(T = \frac{2}{3} \frac{\text{Average KE}}{k_B} \)

where
\(\text{Average KE} \) is the average kinetic energy of the molecules,
\(m \) is the mass of a molecule,
\(v \) is the velocity of a molecule,
\(k_B \) is the Boltzmann constant (\(1.38 \times 10^{-23} \, \text{J/K} \)).

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VIVA QUESTIONS

1. Can you briefly describe the objective of your simulation?

Ans. To predict the performance of an Existing or planned System and to compare alternative solutions for a particular design problem

2. What assumptions did you make in your simulation?

Ans. we believe that Everyone participating in this Simulation is intelligent, capable, cares about doing their best, and wants to improve

3. Can you explain the Lennard-Jones potential and its significance in your simulation?

Ans. A simple pair potential used in physics to accurately model weak van der waals bonds between noble gases & it describes the balance between short-ranged repulsion & long-ranged attraction forces

4. How did you implement periodic boundary conditions in your simulation?

Ans. allows a particle that moves across the edge of the simulation box to re-enter on the other side

5. What kind of analyses can you perform on the simulation data?

Ans. Analyzing a large number of Simulated data sets in the most flexible way to estimate the power of a sampling design and associated analysis method

6. How do you ensure that the simulation results are physically meaningful and accurate?

Ans. 1. Theoretical foundation 2. Correct Equations and Constants 3. Numerical Stability and resolution 4. Validation and testing 5. Iterative refinement

Experiment-3

Implement Natural Language Processing in Multi Sentence Conversation

Date: 23/03/24

AIM

Implement natural language processing in multi sentence conversation.

PROCEDURE

Step-1: Text Preprocessing

Step-2: Feature Extraction

Step-3: Applying NLP Models

Step-4: Text Classification

SOURCE CODE

Steps 1 open colab. google in google chrome

Step2: login with mail

Step3:

```
1) pip install transforms | press ctrl+Enter

click on +code
2) pip install torch | press ctrl+Enter
```

Step3: write code

```
from transformers import GPT2Tokenizer, GPT2LMHeadModel, pipeline
# Load pre-trained model and tokenizer
model_name= 'gpt2-medium'
tokenizer = GPT2Tokenizer.form_pretrained(model_name)
model = GPT2LMHeadModel.from_pretrained(model_name)
#Initialize the text generation pipeline
text_generation_pipeline = pipeline('text-generation', model=model,
                     tokenizer = tokenizer)

class ChatBot:
    def get_init_(self, model_name = 'gpt2-medium'):
        self.tokenizer = GPT2Tokenizer.form_pretrained(model_name)
        self.model = GPT2LMHeadModel.from_pretrained(model_name)
        self.pipeline = pipeline('text-generation', model=self.model, tokenizer
                        =self.tokenizer)
        self.content = ' '
    def get_response(self, user_input):
        #update content
        self.content += f'user : {user_input}\nBot : "
        # Generate response
        response = self.pipeline (self.content, max_length=500, trunc
        -cation=true, pad_token_id = self.tokenizer.
        # Extract and update content with the response
        bot_response = response[0]['generated_text'].split ("Bot:")
        [-1].split("user:")[0].strip()
        self.content += f"{bot_response}\n"
        return bot_response
# Initialize the chatBot
chatbot = chatBot()
```

```
# Example multi_sentence conversation
conversation_history = [
        "Hello! How are you today?",
        "I'm doing great, thanks! what about you?",
        "I'm good as well. what have you been up to?",
        "Just working on some projects. How about you?",
        "Same here. It's been a busy week."
  ]
for user_input in conversation_history:
    bot_response = chatbot.get_response(user_input)
    print(f"user : {user_input}")
    print(f"Bot : {bot_response}\n")
```

```
tokenizer_config.json: 100% |████████████████| 26.0/26.0 [00:00<00:00 866B/s]
vocab.json: 100% |████████████████| 1.04M/1.04M
merges.txt: 100% |████████████████| 456k/456k
tokenizer.json: 100% |████████████████| 1.36M/1.36M
config.json: 100% |████████████████| 718/718
model.safetensors: 100% |████████████████| 1.02G/1.02G
generation_config.json: 100% |████████████████| 124/124
```

OUTPUT

```
user: Hello! How are you today?
Bot: Not all of us do that, but we did that. and we do
     that too, so... we'll. *smiling*. I know I will. for the
     next couple of hours

user: I'm doing great, thanks! what about you?
Bot: that's not the same thing that I felt... I just wanted
     to get back into the routine

user: I'm doing great, good as well. What have you been up
     to?
Bot: well... it means that I can't go to my rooms as I
     like because I have a very special reason for it to
     be private

user: Just working on some projects. How about you?
Bot: yes I did

user: same here. its been a busy week.
Bot : *smiles*.....
```

VIVA QUESTIONS

1. Can you explain the main steps involved in preprocessing text for NLP tasks?

Ans. text cleaning, tokenization, stopword removal, and stemming

2. What is the purpose of using the TF-IDF method in NLP?

Ans. helps determine the importance of words in a document or text corpus

3. How does the Bag-of-Words model differ from word embeddings?

Ans. By constructing a column with the new words

4. What is the importance of Named Entity Recognition (NER) in NLP?

Ans. Extracts information from text NER involves detecting and categorizing important information

5. What challenges might you encounter when processing multi-sentence conversations, and how can you address them?

Ans. Some common challenges are lack of understanding among the parties

30/8/24

Experiment-4

Create Election Campaign Content

Date: 25/09/24

AIM

Create election campaign content.

PROCEDURE

Step-1: Define Campaign Goals

Step-2: Understand Your Audience

Step-3: Develop Key Messages

Step-4: Choose the Right Platforms

Step-5: Content Creation with ChatGPT

Step-6: Legal Compliance and Ethical Considerations

SOURCE CODE

Prompt: Create a compelling election campaign for Harsika, a candidate running for MLA. the content should highlight her commitment to positive change and her qualifications for the role focus on key issues such as quality education, healthcare accessibility, economic empowerment, and infrastructure development and provide information on how people can get involved with her campaign

Hansika for MLA

'A vision for tomorrow, Action for today'

Support Hansika in her mission to bring positive change to our community as your next MLA

Key issues

1 Quality Education for all: Hansika pledges to ensure that every child in our constituency receives the best possible education, with improved facilities, skilled teachers and modern learning resources

2 Healthcare Accessibility: She is dedicated to making health care affordable and accessible

3 Economic Empowerment: Hansika plans to boost local businesses, create job opportunities and support entrepreneurs to strengthen our economy and reduce unemployment

4 Infrastructure development: from better roads to enhanced public transport

Achievements

Advocated for educational reforms that lead to the establishment of new schools and scholarship programs

Spearheaded healthcare initiatives, resulting in improved medical services and facilities in underserved areas

Championed local businesses, securing funding and resources for startup and small enterprises

Call to action

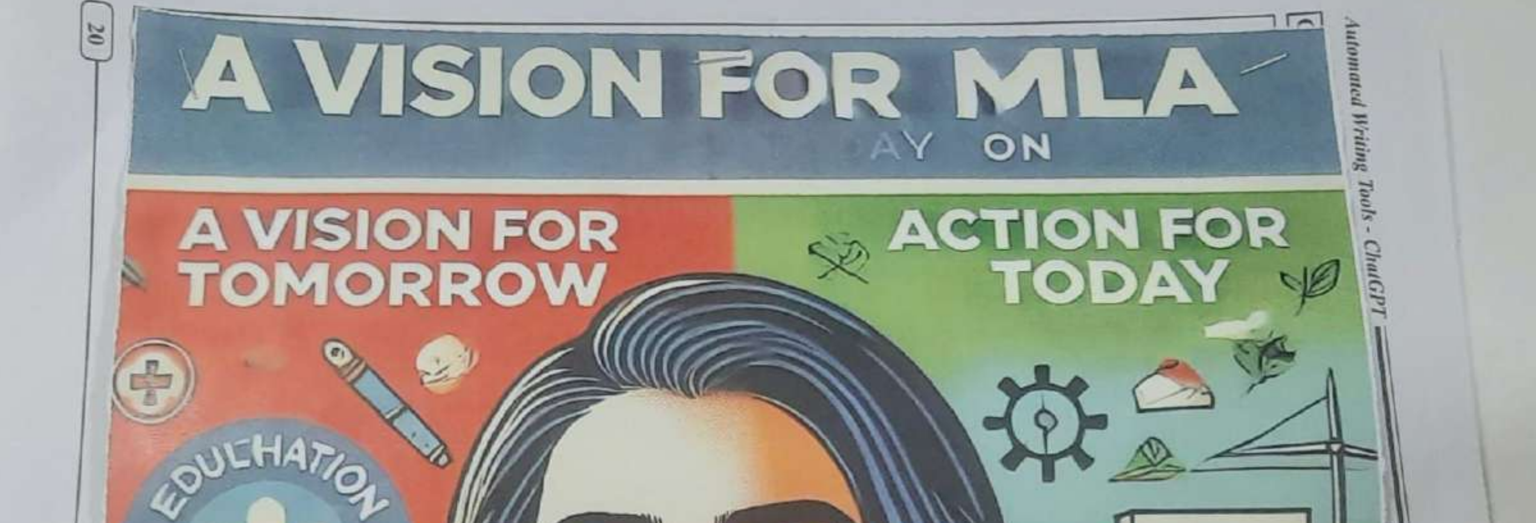
your vote is crucial! elect Hansika as your MLA, and together, we build a future that reflects our shared values and aspirations

Get involved:

- Volunteer: Be a part of Hansika's campaign and help us reach every corner of our constituency
- Donate: Every contribution helps us get closer to victory.
- Stay connected: follow Hansika's journey and get the latest updates [Hansika websitename]

Hansika is not just a candidate; she is your voice, your hope and your future. Lets stand together and make our community the best it can be

Vote Hansika for MLA on 28 July 2025


A VISION FOR MLA
AY ON
A VISION FOR TOMORROW
ACTION FOR TODAY
EDUCHATION
HEALTHICARE
VASTIAN
ECONOMIC GOMELVTHHT
MLA
ENGENDCTURE DEVELOPMENT
HANSIKA

VIVA QUESTIONS

1. What are the key components of an effective election campaign content strategy?

Ans. political climate, Evolving demographic,
salient issues
encumbency Impact

2. How do you determine the most effective messages for different demographic groups in an election campaign?

Ans. voter voice is a centralized digital advocacy platform that gives you access to all the demographic data

3. Can you describe a successful campaign content piece you developed or would develop? What made it effective?

Ans. my most successful marketing campaign was positioning our company to our target market

4. How do you measure the success of election campaign content?

Ans. improving access to election data
improving data literacy among government
conducting data analysis in order to assess the quality

5. What ethical considerations should be taken into account when creating and distributing election campaign content?

Ans. transparency
safety
trustworthiness

30/8/24

Experiment-5

Edit [illegible]hange Text that Makes it Useful for Customer Service

Date: 30/09/24

AIM

Edit and change text that makes it useful for customer service

PROCEDURE

Step-1: Clarity and Conciseness

Step-2: Tone and Politeness

Step-3: Personalization

Step-4: Accuracy and Relevance

Step-5: Problem Solving Orientation

Step-6: Formatting for Readability

Step-7: Feedback Encouragement

SOURCE CODE

Steps:

① open google chrome

② search for URL Chatbase.io and click on chatbase api API-Based chat source

③ click on Build your chatbot for free

④ click on profile and select team name

⑤ Contd.

⑥ click on website and type website URL

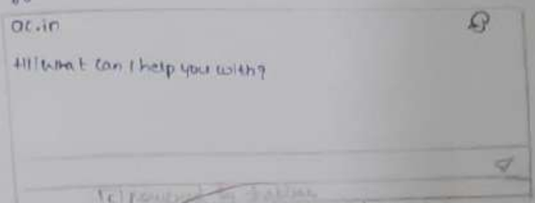
⑦ have to fetch the URL link 10, above 10 will show error

⑧ after selecting 10 URL among all, total detected characters should be 400,000 limit

⑨ after selecting click on create chatbot

Playground Activity Source Connect settings

playground.



Hi! What can I help you with?

⑩ add profile by clicking → chat interface settings options then click on AI

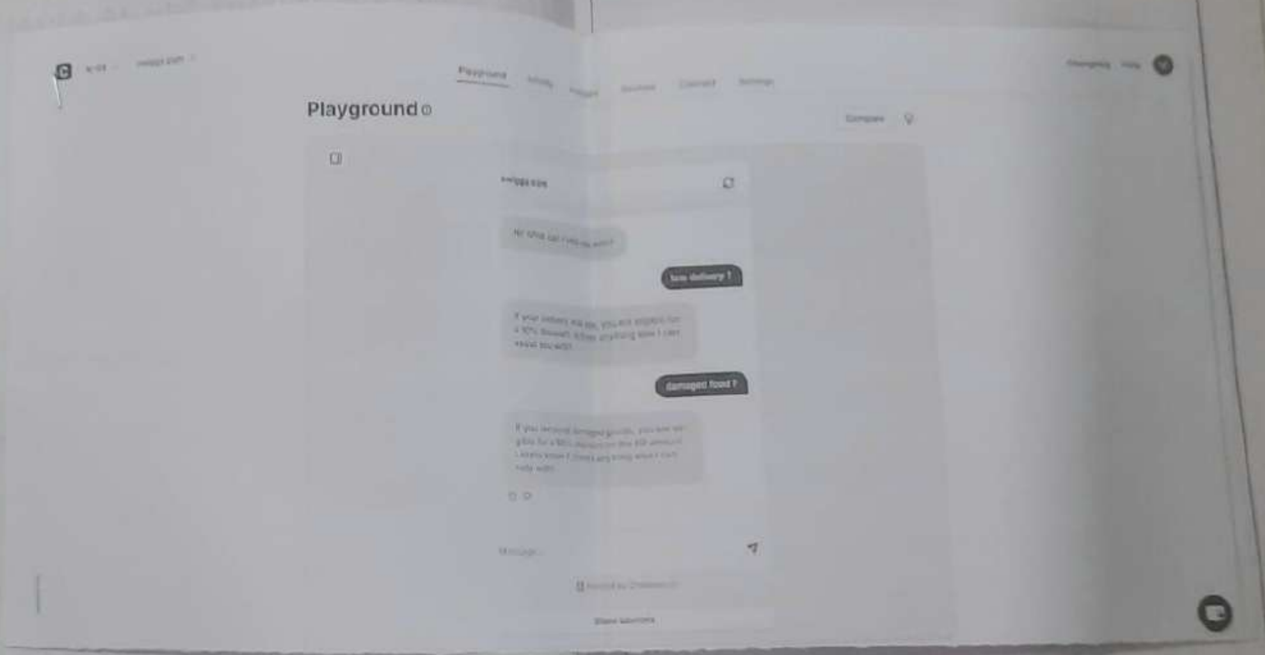
↳ add information there.

⑪ In chat interface you have available options like update profile picture, chat icon, user message color after modifying click on save.

⑫ can add college order, information in AI, that will provide answers to questions in playground option

⑬ By adding information in AI only chatbot will able to give answers to questions

OUTPUT



Excellent

VIVA QUESTIONS

1. How do you ensure confidentiality and privacy when discussing sensitive information with customers?

Ans. use a secure file-sharing and messaging platform
store physical documents in an Environment

2. How do you define excellent customer service?

Ans. providing a seamless, personalized experience
that exceeds a customers Expectations

3. How do you handle a situation where a customer's request cannot be fulfilled?

Ans. propose alternate Solutions and give them
choices

4. What strategies do you use to handle stress in high-pressure customer service environments?

Ans. social support
priority lasts
time management

5. What importance do you place on product knowledge in customer service?

Ans. Ensures that the information relayed to
customers is not only accurate but also
solution oriented

Experiment-6

Carry out Python Code Translation

Date: 6/09/24

AIM

Carry out python code translation

PROCEDURE

Step-1: Understand the Model Architecture

Step-2: Initialize a TensorFlow Model

Step-3: Translate Layers

Step-4: Handle Activations and Other Operations

Step-5: Compile the Model

Step-6: Testing and Validation

SOURCE CODE

```
Step1: open google chrome
step2: search for google to colab
step3: open that (google to colab) URL
Step 4: Source code [9375]
#import libraries
import numpy as np
Import torch
import torch.nn.functional as F
```

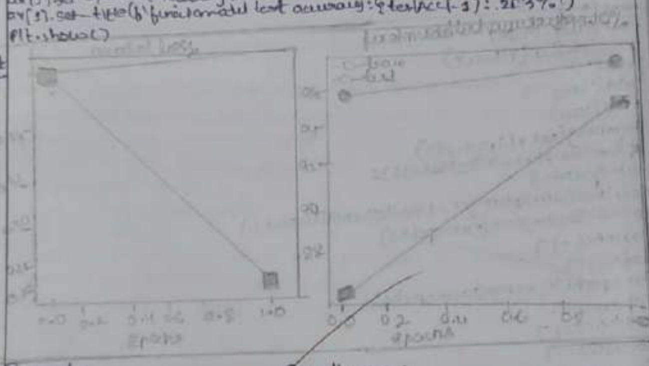
```
from torch.utils.data import Data import DataLoader, TensoDataset
from Sklearn.model-selection import train_test-split
from torchsummary import summary
import matplotlib.pyplot as plt
from Ipython import display
display.set_matplotlib_formats('svg')
data = np.loadtxt(open('sample_data/mnist_train_small.csv','rb'),delimiter=',')
labels = data[:,0)
data = data[:,1:)
dataNorm=data/np.max(data)
dataNorm=dataNorm.reshape(dataNorm.shape[0],1,28,28)
dataNorm.shape
dataT = torch.tensor(dataNorm).float()
labelsT = torch.tensor(labels)-long()
train-data,test_data,train labels,test_labels=train_test-split(dataT,labels,test-
train-data=TensorDataset(train-data,train_labels)
test-data = TensorDataset(test-data,test-labels)
batchsize = 32
train-loader =DataLoader(train-data,batch-size=batchsize,Shuffle=True,drop-last=
test-loader = DataLoader(test data,batch size=test-data-tensors[0].shape[0])
train-loader.dataset-tensors[0]shape
def CreateTheMNISTNet(printtoggle = false):
class mnistNet(nn-module):
 def_Init__(self,printtoggle):
  Super().__init__()
  Self.conv1=nn.Conv2d(1,10,kernel-size=5,stride=1,padding=1)
  Self.conv2=nn-Conv2d(10,20,kernel-size=5,stride=1,padding=1)
  expectsize=np-floor((5+2*0-1)/1)+1
  Expectsize=20*int(expectsize**2)
  Self-fc1=nn.Linear(expectsize,50)
  Self.out=nn-Linear(50,10)
 Self.print=printtoggle
 def forword(self,x):
  print(f'Input:{x.shape}') if self-print else none
  x=F.relu(F.max-Pool2d(self.conv1(x),2))
  Print(f'Layer conv1/pool1:{x-shape}') if self-print else None
```

```
x=F.relu(F.max-pool2d(self.conv2(x),2))
print(f'Layer conv2/pool2:{x-shape}') if self.print else None.
nUnits = x.shape-numel()/x.shape[0]
x=x.view(-1,int(nUnits))
if self-print:print(f'vectorize:{x-shape}')
x=F.relu(self.fc1(x))
if self.print:print(f'Layer fc1:{x-shape}')
x=self.out(x)
if self-print:print(f'Layer out:{x.shape}')
return x
net = mnistNet(printtoggle)
lossfun = nn-CrossEntropyLoss()
optimizer=torch-optim-Adam(net.parameters(),lr=.001)
return net,lossfun,optimizer
net,lossfun,optimizer=createTheMNISNet(true)
x,y=next(iter(train_loader))
yHat=net(x)
print(' ')
Print(yHat-shape)
loss=lossfun(yHat,y)
Print(' ')
print('loss:')
Print(loss)
summary(net,(1,28,28))
def functionstrainTheModels():
numepochs=2
net,lossfun,optimizer=createTheMNISTNet()
losses=Torch-zeros(numepochs)
trainAcc=[]
testAcc=[]
for epochi in range(numepochs):
net-train()
batchAcc=[]
batchloss=[]
for x,y in train-loader:
yHat=net(x)
loss=lossfun(yHat,y)
optimizer-zero-grad()
loss.backward()
optimizer-step()
batchloss-append(loss.item())
```

OUTPUT

```
matches =torch.argmax(yHat,axis 1)==y
matchesNumeric =matches.float()
accuracyPct =100*torch.mean(matchesNumeric)
batchAcc.append(accuracypct)
trainAcc.append(np.mean(batchAcc))
losses[epochi]=np.mean(batchLoss)
net.eval()
x,y=next(iter(test_loader))
with torch.no_grad():
    yHat =net(x)
testAcc.append(100*torch.mean((torch.argmax(yHat,axis1)==y).float()))
return trainAcc,testAcc,losses,net
trainAcc,testAcc,losses,net = function2trainthemodel()
ax[1].plot(trainAcc,'s-',label='train')
ax[1].set_xlabel('Epochs')
ax[1].set_ylabel('Accuracy(%)')
ax[1].set_title(f'functionmodel test accuracy:{testAcc[-1]:.2f}%')
plt.show()
```

Output



Examples

Here is a simple "HelloWorld code in python

```
Print ("Hello, World!")
```

O/P: Hello, world!

Tensorflow code:

```
Import tensorflow as tf
hello=tf.constant("hello,world!")
print(hello.numpy().decode())
```

Excellent

VIVA QUESTIONS

1. What are the main differences between PyTorch and TensorFlow?

Ans. pytorch is ideal for research and small-scale projects prioritizing flexibility. Tensorflow is ideal for large-scale projects and production Environments

2. How do you convert a PyTorch model to a TensorFlow model?

Ans. AI Edge torch is a library lets you convert pytorch models into a tflite format

3. Can you give an example of how a common layer like nn.Conv2d in PyTorch would be translated to TensorFlow?

Ans. in pytorch nn.conv2d layer expects the input tensor to have the shape (batch size, channels, height, width), whereas in Tensorflow tf.keras.layers.conv2D.

4. How do you compile a TensorFlow model translated from PyTorch, and why is this step necessary?

Ans. It defines the optimizer, loss, function, and Evaluation metrics

(eg: adam)

5. What are the potential pitfalls when manually translating a model from PyTorch to TensorFlow?

Ans. PyTorch uses the input format (batch size, channels, height, width)

Experiment-7

Execute Python Code Cleaning

Date: 12/10/24

AIM

Execute python code cleaning.

PROCEDURE

Step-1: Formatting and Style.

Step-2: Naming Conventions

Step-3: Refactoring

Step-4: Optimization

Step-5: Error Handling

Step-6: Documentation

Step-7: Testing

Step-8: Use Linters and Formatters

Step-9: Code Reviews

Step-10: Continuous Integration (CI)

SOURCE CODE

~~There are two methods to Execute this Experiment~~

~~method-1~~

~~step①: open googlechrome~~

~~step②: search for ChatGPT~~

~~step③: login ChatGPT and type prompt "Execute python code~~

ENTER chatGPT With Valid login

step①: Deliberately, write a wrong/Bad code.
Inspect/review it for errors

step②: Ask chatGPT to write optimized/clean code with formatting, Naming Conventions, Refactoring, optimization, Error handling, Documentation, Testing, use linters, formatters, code reviews and Continuous Integration

Prompt: write a bad code of multiplication of two numbers with user input in python

```
def multiply():
  num1 = input("Enter first number:")
  num2 = input("Enter second number:")
  result = num1 + num2
  Print("The result is:" +result)
  multiply()
```

Output: ERROR!

PROMPT: write the correct optimized code

```
def multiply():
  try:
    num1 = float(input("Enter first number:"))
    num2 = float(input("Enter second number:"))
    result = num1 * num2
    Print(f"The result is : {result}")
  except ValueError:
```

```
print("Invalid input. Please enter numeric values.")
multiply()
```

Improvements: ① type conversion ② error handling
③ formatted output

PROMPT: Do formatting and style, naming conventions, Refactoring, optimization Error Handling. Documentation Testing, use linters and formatting, code review and continuous integration.

```
def multiply_numbers(num1: float, num2: float) -> float.
"""
Multiply two numbers.
Parameters
num1 (float): The first number.
num2 (float): The second number
Returns
float: The product of num1 and num2
"""
return num1 * num2
def get_float_input(prompt: str) -> float:
"""
Get a float input from the user
parameters
prompt(str): the prompt message for user input
Returns:
float: the user provided float
Raises
ValueError: if the input is not a valid float.
"""
while True:
 try:
  return float(input(prompt))
Except ValueError:
```

```
print("Invalid input. Please enter a numeric value.")
def main():
 """Main function to execute the multiplication."""
 print("Welcome to the multiplication program")
 num1 = get_float_input("Enter the first number: ")
 num2 = get_float_input("Enter the second number: ")
 result = multiply_numbers(num1, num2)
 print(f"The result of {num1} x {num2} is: {result}")
if __name__ == "__main__":
 main()
```

Key features Explained:

1. Documentation: Each function includes a docstring that explains its purpose, parameters and return value
2. Naming conventions: function names are descriptive and follow the snake_case convention
3. Refactoring: the code is modular, separating concerns into different functions
4. Error Handling: the get_float_input function handles invalid input gracefully by using a loop until valid input is received
5. Optimization: input validation is centralized in a single function to avoid redundancy

Testing

```
import unittest
class TestMultiplication(unittest.TestCase):
 def test_multiply_numbers(self):
```

OUTPUT

```
        self.assertEqual(multiply_numbers(0,5),6)
        self.assertEqual(multiply_numbers(-1,5),-5)
        self.assertEqual(multiply_numbers(0,100),0)
if __name__ == "__main__":
    unittest.main()
```

Linting and formatting

① Install flake8 and black: pip install flake8 black

② Run linting: flake8 multiplication.py

③ Run formatting: black multiplication.py

Continuous Integration:

```
name: CI
on:
 push:
  branches: [main]
pull_request:
  branches: [main]
jobs:
lint:
runs-on: ubuntu-latest
 steps:
  name: checkout code
 steps
  - name: checkout code
  uses: actions/checkout@v2
  - name: Set up python
  uses: actions/setup-python@v2
  with:
    python-version: 3.9
  - name: Install dependencies
  run: |
    pip install flake8 black
  - name: format code
  run: black multiplication.py --check
```

V.Good

VIVA QUESTIONS

1. What are PEP 8 guidelines, and why are they important in Python programming?

Ans. PEP8 provides an extensive set of guidelines for python code styling, promoting readability and a uniform coding standards

2. Can you explain the concept of code refactoring? Provide an example of how you might refactor a piece of Python code to improve its readability or performance?

Ans. the process of modifying an existing code base to improve its structure, design or implementation while preserving the functionality

3. What tools do you use for linting and formatting Python code, and how do they help in code cleaning?

Ans. Flake8 - black format. linters are predefined rules or configurations to identify and report code issues such as unused variables potential bugs.

4. How do you handle error and exception management in Python to ensure robust code?

Ans. The most simple way of handling exceptions in python is by using the 'try' and 'except' block

5. Explain the difference between mutable and immutable objects in Python and how this knowledge impacts the way you write clean code?

Ans. A mutable object can be changing after its created and even an immutable object can't.

Experiment-8

Enact Cross-Lingual Conversations

Date: 13/09/2024

AIM

Enact Cross-Lingual Conversations.

PROCEDURE

Step-1: Identify Languages Involved

Step-2: Set Up Translation Tools

Step-3: Understand the Context

Step-4: Start the Conversation

Step-5: Use ChatGPT for Translation Assistance

SOURCE CODE

there are two methodes to Execute this Experiment 8

method - 1

Step①: open googlechrome

Step②: search for chatGPT

Step③: Login to chatGPT and threw prompt " Enact cross-lingual conversation

method - 2

Step①: open googlechrome

Step②: Search for google colab

Step③: Login to google colab.

Source code 1361

```
⓪pip install googletrans==4.0.0-rc1 langdetect
①from googletrans import translator
from langdetect import detect
translator = Translator()
def detect language(text):
   return detect(text)
def translate text(text , dest_language):
   translation= translator.translate(text, dest=dest_language)
   return translation.text
def cross_lingual conversation():
   print("cross-lingual conversation system")
   print("type 'Exit'-to end the conversation.\n")
   while True :
    user input= input("You: ")
    if user=input.lower()=="Exit":
    print("conversation ended.")
    break
    user language =detect language(user_input)
    if user_language =="en":
     dest language = input("enter the language code you
want to translate to(e.g. 'es' for spanish etc")
```

```
response= translate text(user input dest language)
print(f" Translated({dest_language}):{response}")
else:
   response= translate_text(user input, 'en')
   print(f"Translated (english):{response}")
if user_language = = "en":
  user reply= input (f" Reply in {dest language}:")
-translated_reply translate text (user reply. "en")
  print( f"Translated(English):{translated_reply}")
else:
 user_reply= input ("reply in English:")
-translated_reply=translate_text (user_reply,user language)
 print(f"Translated({user_language}):{translated_reply}")
(cross_lingual_conversation)
```

OUTPUT

ChatGPT v

enact a cross lingual conversa

to enact a cross lingual conversation, I can translate between different languages in real time. you can start by telling me the language you'd like to use

can you provide with telugu and hindi language

Absolutely I can provide my responses in telugu and Hindi

how are you chatGPT

నేను బాగా ఉన్నాను. ధన్యవాదాలు. మీరు ఎలా ఉన్నారు?

Yeah I'm doing great

बिल्कुल! आपके शौक क्या हैं?

I love to watch movies eating food sleeping

ये बहुत अच्छे शौक हैं! कौन सी फिल्में आपको सबसे ज्यादा पसंद हैं?

Wonder and thriller movies

మీకు యాక్షన్ మరియు థ్రిల్లర్ సినిమాలు [illegible].
మీకు [illegible] యాక్షన్ లేదా థ్రిల్లర్ సినిమా ఏదైనా ఉందా?

yes I love all movies

समझ गया! आपकी पसंद की फिल्में सभी तरह की हैं! बात करने के लिए धन्यवाद!

Message ChatGPT

Good

①

ChatGPT can make mistakes. Check important info.

VIVA QUESTIONS

1. How do you ensure accuracy in translation when conducting a cross-lingual conversation?

Ans. 1. know your purpose and audience Context understanding
2. clear communication
3. Active learning 4. verification

2. What are the major challenges of cross-lingual communication and how do you address them?

Ans. Balancing multiple cultural affiliations can be Emotionally challenging and social awkwardness.

3. What role does non-verbal communication play in cross-lingual interactions?

Ans. Proficiency in interpreting these cues not only aids in accurate understanding but also bolsters cross cultural connections

4. How do you handle misunderstandings or miscommunications in a cross-lingual setting?

Ans. 1. clarify and restart 2. use simple languages
3. ask open-Ended Questions 4. Summarize regularly
5. use visual Aids

5. What ethical considerations do you take into account when translating or interpreting in cross-lingual conversations?

Ans. Translators must address issues of cultural sensitivity, avoid biases and ensure that translations are accessible to wide audience

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Experiment-9

Sketch Scientific Image

Date: 20/09/24

AIM

Sketch scientific image.

PROCEDURE

Creating a scientific image using ChatGPT involves several steps, particularly when using tools like DALL-E for image generation.

Step-1: Define the Concept.

Step-2: Detail the Description.

Step-3: Use the Image Generation Tool

Step-4: Generate the Image.

Step-5: Review and Refine

SOURCE CODE

Step①: open google chrome
Step②: search for chatGPT
Step③: give credentials required
TOPIC: AI-Augmented DNA Art
Step④: ask ChatGPT to give me details of AI-Augmented DNA art

ChatGPT will provide the information/content

Step ⑤: ask chatGPT

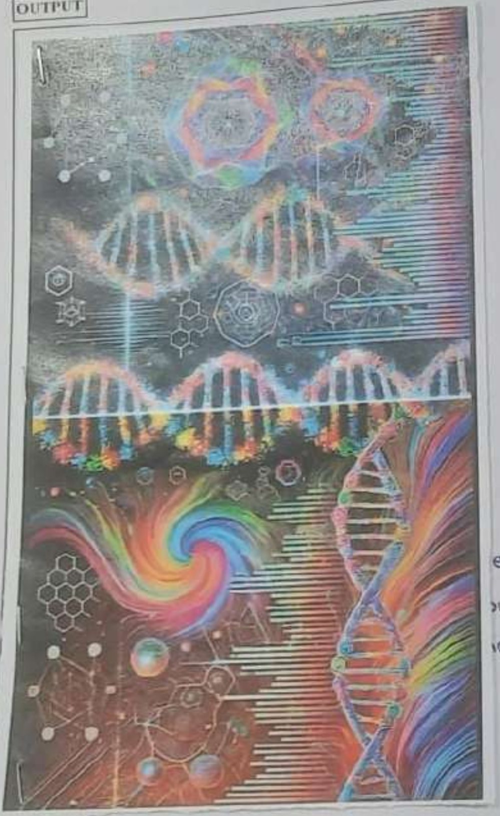
"use above content and give one prompt for image generation

copy it → Go to Explore GPTs, choose DALL-E

PROMPT:

"Create an abstract, visually captivating artwork that represents the fusion of DNA and artificial intelligence. The image should feature intricate, flowing patterns inspired by genetic sequences (Adenine, Thymine, Cytosine, Guanine), with colors and shapes dynamically shifting to reflect individuality. The design should evoke a futuristic, organic feel, blending soft, curving lines of DNA strands with geomentric, data-like symbols that represent AI's interpretation of genetic code. Use a palette of vibrant blues, purples, and greens to highlight the connection between biology and technology, and ensure the overall style feels personal and unique, symbolizing the DNA's individuality."

OUTPUT



ed artwork
ou would like
e vision

VIVA QUESTIONS

1. Can you explain the scientific concept depicted in this image?

Ans. There are a few concepts behind this idea:
1) DNA Structure 2) Visualization
3) Interactivity 4) Cross-Disciplinary Collaboration

2. What tools or software did you use to create this image, and why?

Ans. Some common tools and software are: 1) Generative Art software 2) AI tools 3) Bioinformatics tools 4) 3D Modeling 5) Digital art programs. These tools enable a blend of scientific data

3. How can scientific images like the one you created enhance understanding of complex concepts?

Ans. 1) Visualization of abstract concepts 2) Engagement and interest 3) Simplification and complexity 4) Emotional connections 5) Interdisciplinary insights 6) Storytelling

4. Discuss the importance of color choice in scientific imaging?

Ans. 1) Data representation 2) Emphasis and clarity
3) Emotional impact
4) Aesthetic appeal

5. What ethical considerations did you take into account while creating and presenting this image?

Ans. 1) Accuracy 2) Data Integrity 3) Inclusivity
4) Attribution 5) Contextualization
6) cultural sensitivity 7) audience consideration

Excellent

Experiment-10

Improvise a Research Paper

Date: ____________

AIM

Improvise a research paper.

PROCEDURE

Step-1: Topic Selection and Brainstorming

Step-2: Literature Review

Step-3: Drafting the Research Paper

Step-4: Data Analysis and Interpretation

Step-5: Revising and Editing

Step-6: Finalizing the Manuscript

SOURCE CODE

Step① - Chose a topic. Brainstorm with introduction of the topic
Step② Give me one problem statement on the topic
Step③ Give me most important research hypotheses on topic
Step④ Give me important questions on the topic
Step⑤ [illegible] research objectives of the above
⑥ Give me significance of the above topic
⑦ Give me latest reviews on the topic
[illegible] me formulate research methodologies for the topic

Step⑨ Give 10 questions of any IEEE/ [illegible] Journals on the Topic

Prompt: Write a research paper on 'Chatgpt' latest trend usage and impact of it. include any findings and graphs supporting the data give 10 reference of IEEE or scopus journals. Write an abstract according and rewrite the above papers in 300 lines which is easy to read by even a school going student

Artificial Intelligence (AI)

Abstract

Artificial Intelligence (AI) has rapidly evolved from a theoretical concept to an integral part of our daily lives. This paper aims to provide an overview of AI, its types, applications, challenges, and future prospects. With advancements in machine learning (ML), deep learning, natural language processing (NLP), and robotics, AI is transforming various sectors such as healthcare, finance, education, and manufacturing. The survey highlights key trends in AI development, presents findings from recent research, and offers insights into the challenges faced in the field, such as ethical concerns and biases in AI models. The paper also discusses potential future directions for AI, including the integration of AI with quantum computing and the development of artificial general intelligence (AGI). Statistical findings and data on AI adoption, growth, and performance are provided to emphasize the significance of AI in shaping the future of technology.

Introduction

Artificial Intelligence (AI) is the branch of computer science concerned with creating machines that can perform tasks typically requiring human intelligence. These tasks include reasoning, learning, problem-solving, perception, and natural language understanding. AI encompasses various subfields, including machine learning (ML), neural networks, natural language processing (NLP), and robotics.

In recent years, AI has made significant strides, impacting various industries and sectors globally. From virtual assistants like Siri and Alexa to autonomous vehicles and advanced healthcare systems, AI has become an essential part of modern technology. This paper provides a comprehensive survey of the current state of AI, exploring its types, applications, challenges, and future directions.

Types of AI

AI can be broadly classified into two categories:

1. Narrow AI (Weak AI):

Narrow AI refers to AI systems that are designed and trained to perform a specific task. Examples include facial recognition systems, recommendation engines, and AI used in virtual assistants. These systems excel at performing one function but lack general reasoning abilities.

2. General AI (Strong AI):

General AI, also known as artificial general intelligence (AGI), is still a theoretical concept. AGI aims to create systems that can perform any intellectual task that a human can do. While no true AGI has been developed yet, research in this area continues to progress, with the long-term goal of creating machines that possess cognitive abilities similar to humans.

3. Superintelligent AI:

Superintelligent AI refers to an AI that surpasses human intelligence in all areas, including creativity, problem-solving, and decision-making. Although this is a hypothetical concept, it represents the ultimate goal of AI development for some researchers.

Applications of AI

AI has numerous applications across different industries:

1. Healthcare:

AI is revolutionizing healthcare through applications such as diagnostic tools, drug discovery, and personalized treatment plans. AI models analyze medical data like X-rays, MRIs, and genetic information to help doctors make better decisions.

2. Finance:

In the financial sector, AI is used for fraud detection, algorithmic trading, credit scoring, and risk management. Machine learning models can analyze large datasets to identify patterns and predict market trends.

3. Transportation

Autonomous vehicles, powered by AI, have the potential to transform the transportation industry. AI systems are used to control self-driving cars, ensuring they can navigate roads safely without human intervention.

4. Education

AI in education includes personalised learning systems, where AI adapts to the learning pace and style of individual students. AI-powered chatbots are also used to answer students' questions and provide assistance.

5. Manufacturing: AI optimizes production lines through predictive maintenance, quality control, and supply chain management. Robots equipped with AI can perform repetitive tasks, improving efficiency and reducing human error.

6. Entertainment

AI is used in recommendation systems, where platforms like Netflix and YouTube suggest content based on user preferences. AI is also used in video games to create more realistic and challenging environments.

Findings and Data Analysis

Recent studies highlight the rapid growth of AI technologies. According to a report by PwC, AI could contribute up to $15.7 trillion to the global economy by 2030. A survey conducted by McKinsey & Company in 2023 found that 58% of businesses worldwide have already adopted AI in some form, and 31% of firms plan to increase their AI investments in the coming years.

In terms of AI research, Google Scholar shows a dramatic increase in publications related to machine learning and deep learning, indicating the growing interest and advancements in these areas.

Challenges in AI Development

1. Bias and Fairness:

AI systems are often trained on historical data, which may contain biases. If not properly managed, AI models may reinforce these biases, leading to unfair outcomes, especially in areas like hiring, criminal justice, and lending.

2. Ethical Concerns:

AI raises ethical questions related to privacy, accountability, and decision-making. For example, autonomous vehicles must be programmed to make ethical decisions in situations where accidents are unavoidable.

3. Job Displacement:

As AI systems become more capable, there are concerns about job displacement in industries like manufacturing, customer service, and transportation. While AI creates new jobs, there is a need for upskilling the workforce to adapt to new technological realities.

4. Security and Safety:

AI systems are vulnerable to adversarial attacks, where malicious actors manipulate AI models to produce incorrect or harmful outputs. Ensuring the security and safety of AI systems is critical to their widespread adoption.

Future Directions of AI

The future of AI holds immense potential. Key areas of focus for researchers and industry experts include:

1. Artificial General Intelligence (AGI):

Researchers are working toward the development of AGI, which could perform any cognitive task that humans can. While AGI is still in the theoretical phase, it is considered the ultimate goal of AI research.

2. AI and Quantum Computing:

The combination of AI with quantum computing could revolutionize fields such as cryptography, drug discovery, and optimization. Quantum computers have the potential to solve problems that are currently intractable for classical computers.

3. AI for Sustainability:

AI can contribute to addressing global challenges such as climate change, resource management, and sustainable agriculture. AI models can optimize energy consumption, reduce waste, and improve crop yields.

4. Human-AI Collaboration:

The future of AI is not just about replacing human workers but enhancing human capabilities. AI will increasingly serve as a tool for human decision-making, collaboration, and creativity.

Conclusion

Artificial Intelligence is transforming industries and societies, offering significant benefits and presenting challenges that must be addressed. The rapid advancements in AI technologies, particularly in machine learning, deep learning, and robotics, are reshaping the future of various sectors. While the road to Artificial General Intelligence remains long and uncertain, the potential of AI to revolutionize the world is undeniable. As AI continues to evolve, it is crucial to address the ethical, security, and social challenges it presents, ensuring that its benefits are maximized while minimizing its risks.

References

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VIVA QUESTIONS

1. Can you summarize the main objective of your research?

Ans. The main objective of the research is to explore the latest trends in the usage of chatgpt across various sectors

2. What are the key findings of your research on the impact of AI?

Ans. ① Increased productivity
② improved accessibility
③ creativity enhancement

3. Can you discuss any significant gaps in the existing literature that your research aims to address?

Ans. ① longitudinal studies
② ethical framework
③ user demographics

4. What types of data did you analyze in your research?

Ans. ① Surveys and Questionnaires
② usage statistics
③ case studies

5. How did AI tools assist you in analyzing and interpreting your data?

Ans. ① Data processing
② sentiment analyses
③ Statistical analyses