

# AI-Powered OCR, Translation, Text Generation, and Image Generation Pipeline

This project integrates several Azure AI services to create a seamless pipeline for Optical Character Recognition (OCR), text translation, article generation using OpenAI's language models, and image generation based on the generated content. The solution works as follows:

1. **OCR**: Extracts text from an image using Azure Computer Vision.
2. **Translation**: Translates the extracted text into the desired language using Azure Translator.
3. **Text Generation**: Uses the Azure OpenAI service to generate a detailed article based on the translated text.
4. **Image Generation**: Creates a custom image based on the generated text summary using Azure's DALL-E 3 image generation.

Let's dive into the individual components.

```
In [1]: from dotenv import load_dotenv
import os
import time
import asyncio
import requests
from PIL import Image, ImageDraw
from matplotlib import pyplot as plt
from azure.ai.vision.imageanalysis import ImageAnalysisClient
from azure.ai.vision.imageanalysis.models import VisualFeatures
from azure.core.credentials import AzureKeyCredential
from azure.ai.translation.text import *
from azure.ai.translation.text.models import InputTextItem
from openai import AsyncAzureOpenAI
from io import BytesIO
```

## 1. Environment Setup and Dependencies

This section imports all the necessary libraries and dependencies for the project. Key libraries used include:

- **dotenv** for managing environment variables that store credentials and configuration.
- **Azure SDKs** for connecting with Azure services such as Computer Vision (for OCR) and Translator (for language translation).
- **PIL (Python Imaging Library)** and **matplotlib** to handle image manipulation, display, and annotation.
- **OpenAI SDK** for integrating with Azure OpenAI models, specifically for generating text and images based on natural language prompts.
- **asyncio** to manage asynchronous tasks when interacting with the OpenAI models.

This ensures the project is ready to interact with Azure services, manipulate images, and generate content dynamically.

## Loading Environment Variables

The project relies on several API keys and service endpoints to interact with Azure services. These credentials are stored securely in `.env` files. The paths to these environment files are defined, and the required variables are loaded using `dotenv`.

By loading these variables:

- **OCR**: Connects to the Azure Computer Vision API.
- **Translator**: Authenticates with the Azure Translator service.
- **Chat and Image Generation**: Sets up access to Azure OpenAI for both text and image generation models.

This setup ensures that all necessary credentials are available to the application without hardcoding sensitive information in the code.

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## 2. OCR Function

The OCR (Optical Character Recognition) function allows the user to extract text from an image. The user is prompted to either use a sample image or provide their own image file path. Once the image is selected, the function:

- Initializes the Azure Computer Vision client.
- Sends the image to Azure's OCR service to detect and extract text from the image.
- Displays the image with the detected text regions highlighted.

This component provides a foundation for extracting structured text data from unstructured visual data (images), which can then be further processed.

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```
In [2]: ocr_env_file = '05-ocr/Python/read-text/.env'
def ocr():

    global cv_client

    try:
        # Get Configuration Settings
        load_dotenv(ocr_env_file)
        ai_endpoint = os.getenv('AI_SERVICE_ENDPOINT')
        ai_key = os.getenv('AI_SERVICE_KEY')

        # Authenticate Azure AI Vision client
        cv_client = ImageAnalysisClient(
            endpoint=ai_endpoint,
            credential=AzureKeyCredential(ai_key)
        )

        # Menu for text reading functions
        print('\nUse our sample image or provide your own image to read text from it?\n 1. Use sample image\n 2. Provide your own image\n 3. Exit')
        choice = input('Enter your choice: ')
        if choice == '1':
            image_file = 'ffe8cf4174a3eed39ccb8e3db5dc9d7.jpg'
            text = GetTextRead(image_file)
        elif choice == '2':
            image_file = input('Enter your image file path: ')
            text = GetTextRead(image_file)
        else:
            # Exit
            return

    return text
```

```
except Exception as ex:
    print(ex)

def GetTextRead(image_file):
    print('\n')

    # Open image file
    with open(image_file, "rb") as f:
        image_data = f.read()

    # Use Analyze image function to read text in image
    result = cv_client.analyze(
        image_data=image_data,
        visual_features=[VisualFeatures.READ]
    )

    # Initialize an empty list to store the text lines
    paragraph_text = []

    # Display the image and overlay it with the extracted text
    if result.read is not None:
        print("\nText:")

        # Prepare image for drawing
        image = Image.open(image_file)
        fig = plt.figure(figsize=(image.width/100, image.height/100))
        plt.axis('off')
        draw = ImageDraw.Draw(image)
        color = 'cyan'

        for line in result.read.blocks[0].lines:
            # Append the line text to the paragraph list
            paragraph_text.append(line.text)

            drawLinePolygon = True

            r = line.bounding_polygon
            bounding_polygon = ((r[0].x, r[0].y), (r[1].x, r[1].y), (r[2].x, r[2].y), (r[3].x, r[3].y))

            # Print the position bounding box around each line
            print("    Bounding Polygon: {}".format(bounding_polygon))

            # Return each word detected in the image and the position bounding box around each word with the confidence level of each word
            for word in line.words:
                r = word.bounding_polygon
                bounding_polygon = ((r[0].x, r[0].y), (r[1].x, r[1].y), (r[2].x, r[2].y), (r[3].x, r[3].y))
                print(f"    Word: '{word.text}', Bounding Polygon: {bounding_polygon}, Confidence: {word.confidence:.4f}")

                # Draw word bounding polygon
                drawLinePolygon = False
                draw.polygon(bounding_polygon, outline=color, width=3)

            # Draw Line bounding polygon
            if drawLinePolygon:
                draw.polygon(bounding_polygon, outline=color, width=3)
```

```
# Save image with drawn polygons
plt.imshow(image)
plt.tight_layout(pad=0)
outputfile = 'text.jpg'
fig.savefig(outputfile)
print('\n  Results saved in', outputfile)

# Join the list of lines into a paragraph
paragraph = " ".join(paragraph_text)
print("\nRecognized Paragraph:\n", paragraph)

return paragraph # Return the whole paragraph as text
```

In [3]: text = ocr()

Use our sample image or provide your own image to read text from it?

1. Use sample image
2. Provide your own image
3. Exit

Text:

Bounding Polygon: ((563, 219), (1905, 225), (1904, 411), (562, 407))  
Word: 'The', Bounding Polygon: ((569, 220), (791, 220), (785, 400), (562, 384)), Confidence: 0.9170  
Word: 'New', Bounding Polygon: ((826, 220), (1080, 221), (1076, 411), (820, 402)), Confidence: 0.9510  
Word: 'york', Bounding Polygon: ((1129, 221), (1445, 224), (1442, 411), (1126, 411)), Confidence: 0.6750  
Word: 'Times', Bounding Polygon: ((1480, 225), (1900, 231), (1900, 387), (1478, 410)), Confidence: 0.6120  
Bounding Polygon: ((1987, 234), (2289, 234), (2288, 266), (1987, 266))  
Word: 'LATE', Bounding Polygon: ((1989, 234), (2068, 235), (2067, 266), (1987, 267)), Confidence: 0.9790  
Word: 'CITY', Bounding Polygon: ((2078, 235), (2147, 236), (2147, 266), (2077, 266)), Confidence: 0.9790  
Word: 'EDITION', Bounding Polygon: ((2158, 236), (2278, 236), (2278, 267), (2157, 266)), Confidence: 0.9890  
Bounding Polygon: ((228, 266), (422, 272), (421, 305), (228, 299))  
Word: '"All', Bounding Polygon: ((233, 267), (289, 268), (288, 302), (233, 300)), Confidence: 0.8840  
Word: 'the', Bounding Polygon: ((296, 269), (337, 270), (335, 303), (295, 302)), Confidence: 0.9980  
Word: 'News', Bounding Polygon: ((344, 270), (419, 273), (416, 305), (342, 303)), Confidence: 0.9930  
Bounding Polygon: ((1988, 277), (2295, 279), (2295, 300), (1988, 298))  
Word: 'Weather:', Bounding Polygon: ((1994, 277), (2075, 279), (2073, 300), (1991, 298)), Confidence: 0.9940  
Word: 'Rain,', Bounding Polygon: ((2081, 279), (2128, 280), (2127, 300), (2079, 300)), Confidence: 0.9930  
Word: 'warm', Bounding Polygon: ((2133, 280), (2172, 280), (2171, 300), (2131, 300)), Confidence: 0.9930  
Word: 'today;', Bounding Polygon: ((2186, 280), (2243, 280), (2242, 300), (2185, 300)), Confidence: 0.9890  
Word: 'clear', Bounding Polygon: ((2247, 280), (2291, 280), (2290, 299), (2246, 300)), Confidence: 0.9930  
Bounding Polygon: ((198, 307), (454, 308), (453, 341), (198, 338))  
Word: 'That's', Bounding Polygon: ((202, 308), (284, 308), (282, 339), (201, 337)), Confidence: 0.9750  
Word: 'Fit', Bounding Polygon: ((290, 308), (331, 309), (329, 340), (288, 339)), Confidence: 0.9980  
Word: 'to', Bounding Polygon: ((337, 309), (363, 309), (362, 340), (335, 340)), Confidence: 0.9980  
Word: 'Print"', Bounding Polygon: ((372, 309), (453, 309), (451, 342), (370, 341)), Confidence: 0.9450  
Bounding Polygon: ((1987, 296), (2290, 298), (2290, 322), (1987, 320))  
Word: 'tonight.', Bounding Polygon: ((1991, 297), (2061, 299), (2060, 321), (1990, 321)), Confidence: 0.9890  
Word: 'Sunny,', Bounding Polygon: ((2066, 300), (2124, 301), (2123, 322), (2065, 321)), Confidence: 0.9940  
Word: 'pleasant', Bounding Polygon: ((2128, 301), (2198, 301), (2198, 321), (2127, 322)), Confidence: 0.9930  
Word: 'tomorrow.', Bounding Polygon: ((2203, 301), (2290, 301), (2290, 320), (2202, 321)), Confidence: 0.9940  
Bounding Polygon: ((1987, 317), (2290, 317), (2290, 341), (1987, 344))  
Word: 'Temp.', Bounding Polygon: ((1994, 318), (2049, 320), (2048, 344), (1993, 345)), Confidence: 0.9930  
Word: 'range:', Bounding Polygon: ((2054, 320), (2111, 321), (2110, 343), (2052, 344)), Confidence: 0.9930  
Word: 'today', Bounding Polygon: ((2116, 321), (2162, 321), (2162, 342), (2115, 343)), Confidence: 0.9950  
Word: '80-66;', Bounding Polygon: ((2170, 321), (2225, 320), (2225, 340), (2170, 342)), Confidence: 0.9590  
Word: 'Sunday', Bounding Polygon: ((2229, 320), (2289, 318), (2289, 338), (2229, 340)), Confidence: 0.9940  
Bounding Polygon: ((1990, 337), (2292, 339), (2292, 366), (1990, 365))  
Word: '71-66.', Bounding Polygon: ((1992, 338), (2043, 339), (2043, 364), (1992, 366)), Confidence: 0.9790  
Word: 'Temp', Bounding Polygon: ((2047, 339), (2087, 340), (2087, 363), (2047, 364)), Confidence: 0.9890  
Word: '.-', Bounding Polygon: ((2091, 340), (2100, 341), (2100, 363), (2091, 363)), Confidence: 0.9030  
Word: 'Hum.', Bounding Polygon: ((2105, 341), (2151, 342), (2151, 363), (2105, 363)), Confidence: 0.9170  
Word: 'Index', Bounding Polygon: ((2156, 342), (2204, 342), (2204, 363), (2156, 363)), Confidence: 0.9930  
Word: 'yesterday', Bounding Polygon: ((2209, 342), (2290, 342), (2290, 364), (2209, 363)), Confidence: 0.9930  
Bounding Polygon: ((1986, 355), (2289, 359), (2288, 385), (1986, 384))  
Word: '69.', Bounding Polygon: ((1991, 356), (2018, 358), (2018, 385), (1991, 385)), Confidence: 0.9930  
Word: 'Complete', Bounding Polygon: ((2022, 358), (2103, 361), (2103, 383), (2022, 385)), Confidence: 0.9930  
Word: 'U.S.', Bounding Polygon: ((2109, 361), (2146, 362), (2146, 383), (2109, 383)), Confidence: 0.9880  
Word: 'report', Bounding Polygon: ((2151, 363), (2207, 363), (2207, 383), (2151, 383)), Confidence: 0.9930  
Word: 'on', Bounding Polygon: ((2212, 363), (2233, 364), (2233, 384), (2212, 384)), Confidence: 0.9930

Word: 'P.', Bounding Polygon: ((2241, 364), (2262, 364), (2262, 384), (2241, 384)), Confidence: 0.9940  
Word: '50.', Bounding Polygon: ((2266, 364), (2289, 363), (2289, 385), (2266, 384)), Confidence: 0.9930  
Bounding Polygon: ((154, 429), (440, 431), (440, 462), (153, 460))  
Word: 'VOL.CXVIII.No.40,721', Bounding Polygon: ((161, 430), (440, 432), (437, 463), (160, 460)), Confidence: 0.9150  
Bounding Polygon: ((555, 436), (791, 436), (791, 457), (555, 457))  
Word: '1969', Bounding Polygon: ((574, 437), (601, 437), (599, 457), (573, 457)), Confidence: 0.5640  
Word: 'The', Bounding Polygon: ((604, 437), (627, 438), (625, 457), (603, 457)), Confidence: 0.8580  
Word: 'New', Bounding Polygon: ((631, 438), (657, 438), (655, 457), (629, 457)), Confidence: 0.7430  
Word: 'York', Bounding Polygon: ((661, 438), (691, 438), (690, 458), (660, 457)), Confidence: 0.9530  
Word: 'Times', Bounding Polygon: ((695, 438), (731, 438), (729, 458), (694, 458)), Confidence: 0.9750  
Word: 'Company.', Bounding Polygon: ((735, 438), (792, 438), (790, 458), (733, 458)), Confidence: 0.9550  
Bounding Polygon: ((1003, 426), (1458, 428), (1458, 459), (1003, 458))  
Word: 'NEW', Bounding Polygon: ((1004, 427), (1058, 428), (1058, 458), (1004, 457)), Confidence: 0.9980  
Word: 'YORK,', Bounding Polygon: ((1078, 428), (1163, 428), (1163, 459), (1078, 458)), Confidence: 0.9940  
Word: 'MONDAY,', Bounding Polygon: ((1169, 428), (1293, 429), (1293, 459), (1169, 459)), Confidence: 0.9940  
Word: 'JULY', Bounding Polygon: ((1299, 429), (1365, 429), (1365, 459), (1299, 459)), Confidence: 0.9920  
Word: '21,1969', Bounding Polygon: ((1373, 429), (1458, 429), (1458, 457), (1373, 458)), Confidence: 0.9470  
Bounding Polygon: ((1799, 429), (1827, 432), (1825, 464), (1796, 462))  
Word: 'x', Bounding Polygon: ((1805, 429), (1822, 430), (1819, 463), (1802, 462)), Confidence: 0.9590  
Bounding Polygon: ((2153, 434), (2290, 433), (2290, 459), (2153, 461))  
Word: '10', Bounding Polygon: ((2154, 434), (2179, 434), (2179, 461), (2154, 462)), Confidence: 0.9980  
Word: 'CENTS', Bounding Polygon: ((2192, 434), (2289, 435), (2286, 460), (2191, 460)), Confidence: 0.9940  
Bounding Polygon: ((155, 504), (2283, 507), (2283, 683), (155, 680))  
Word: 'MEN', Bounding Polygon: ((158, 505), (549, 505), (548, 682), (156, 678)), Confidence: 0.9940  
Word: 'WALK', Bounding Polygon: ((668, 505), (1211, 505), (1211, 683), (667, 683)), Confidence: 0.9510  
Word: 'ON', Bounding Polygon: ((1329, 506), (1570, 506), (1571, 683), (1330, 683)), Confidence: 0.9590  
Word: 'MOON', Bounding Polygon: ((1701, 506), (2220, 509), (2222, 683), (1702, 683)), Confidence: 0.9930  
Bounding Polygon: ((151, 751), (2206, 753), (2206, 883), (151, 877))  
Word: 'ASTRONAUTS', Bounding Polygon: ((169, 758), (1013, 751), (1011, 872), (167, 872)), Confidence: 0.9930  
Word: 'LAND', Bounding Polygon: ((1086, 751), (1427, 751), (1427, 875), (1085, 872)), Confidence: 0.9870  
Word: 'ON', Bounding Polygon: ((1509, 752), (1659, 752), (1658, 877), (1508, 875)), Confidence: 0.9970  
Word: 'PLAIN;', Bounding Polygon: ((1772, 753), (2203, 756), (2203, 884), (1772, 879)), Confidence: 0.9850  
Bounding Polygon: ((230, 891), (2270, 893), (2270, 1020), (229, 1017))  
Word: 'COLLECT', Bounding Polygon: ((234, 895), (790, 892), (787, 1017), (230, 1003)), Confidence: 0.9960  
Word: 'ROCKS,', Bounding Polygon: ((880, 892), (1372, 891), (1370, 1020), (877, 1018)), Confidence: 0.9920  
Word: 'PLANT', Bounding Polygon: ((1422, 892), (1858, 894), (1857, 1017), (1420, 1020)), Confidence: 0.9970  
Word: 'FLAG', Bounding Polygon: ((1924, 894), (2241, 897), (2241, 1009), (1923, 1016)), Confidence: 0.9860  
Bounding Polygon: ((141, 1076), (610, 1076), (610, 1138), (141, 1138))  
Word: 'Voice', Bounding Polygon: ((145, 1076), (282, 1078), (281, 1136), (145, 1139)), Confidence: 0.9940  
Word: 'From', Bounding Polygon: ((298, 1078), (416, 1079), (415, 1135), (298, 1136)), Confidence: 0.9870  
Word: 'Moon:', Bounding Polygon: ((447, 1079), (608, 1080), (607, 1137), (446, 1135)), Confidence: 0.9930  
Bounding Polygon: ((1763, 1084), (2265, 1082), (2265, 1142), (1763, 1145))  
Word: 'A', Bounding Polygon: ((1768, 1085), (1799, 1085), (1799, 1146), (1768, 1146)), Confidence: 0.9940  
Word: 'Powdery', Bounding Polygon: ((1828, 1085), (2050, 1083), (2049, 1144), (1827, 1146)), Confidence: 0.9940  
Word: 'Surface', Bounding Polygon: ((2067, 1083), (2258, 1083), (2257, 1143), (2066, 1144)), Confidence: 0.9950  
Bounding Polygon: ((180, 1153), (668, 1150), (669, 1214), (180, 1217))  
Word: 'Eagle', Bounding Polygon: ((181, 1154), (338, 1156), (338, 1217), (181, 1216)), Confidence: 0.9170  
Word: 'Has', Bounding Polygon: ((351, 1156), (453, 1156), (453, 1217), (351, 1217)), Confidence: 0.9980  
Word: 'Landed', Bounding Polygon: ((465, 1156), (667, 1150), (667, 1214), (465, 1217)), Confidence: 0.9590  
Bounding Polygon: ((1798, 1156), (2300, 1155), (2300, 1222), (1798, 1223))  
Word: 'Is', Bounding Polygon: ((1798, 1157), (1851, 1157), (1851, 1223), (1798, 1223)), Confidence: 0.9960  
Word: 'Closely', Bounding Polygon: ((1864, 1157), (2050, 1158), (2050, 1223), (1864, 1223)), Confidence: 0.9940  
Word: 'Explored', Bounding Polygon: ((2064, 1158), (2293, 1156), (2293, 1223), (2064, 1223)), Confidence: 0.9940  
Bounding Polygon: ((190, 1245), (651, 1251), (650, 1276), (189, 1270))  
Word: 'EAGLE', Bounding Polygon: ((201, 1246), (262, 1247), (261, 1272), (199, 1271)), Confidence: 0.9860  
Word: '(the', Bounding Polygon: ((272, 1247), (310, 1247), (309, 1272), (271, 1272)), Confidence: 0.9860

Word: 'lunar', Bounding Polygon: ((319, 1248), (369, 1248), (368, 1273), (317, 1272)), Confidence: 0.9890  
Word: 'module:', Bounding Polygon: ((374, 1248), (455, 1250), (455, 1274), (373, 1273)), Confidence: 0.9590  
Word: 'Houston,', Bounding Polygon: ((460, 1250), (544, 1251), (544, 1275), (459, 1274)), Confidence: 0.9930  
Word: 'Tranquility', Bounding Polygon: ((551, 1251), (649, 1253), (649, 1276), (550, 1275)), Confidence: 0.9900  
Bounding Polygon: ((159, 1270), (452, 1271), (452, 1295), (159, 1294))  
Word: 'Base', Bounding Polygon: ((161, 1270), (204, 1271), (204, 1295), (161, 1294)), Confidence: 0.9900  
Word: 'here.', Bounding Polygon: ((210, 1271), (256, 1272), (256, 1295), (210, 1295)), Confidence: 0.7590  
Word: 'The', Bounding Polygon: ((262, 1272), (293, 1272), (293, 1295), (262, 1295)), Confidence: 0.9990  
Word: 'Eagle', Bounding Polygon: ((301, 1272), (349, 1273), (349, 1294), (301, 1295)), Confidence: 0.9920  
Word: 'has', Bounding Polygon: ((354, 1273), (386, 1273), (386, 1294), (354, 1294)), Confidence: 0.9970  
Word: 'landed.', Bounding Polygon: ((391, 1273), (452, 1274), (452, 1292), (391, 1294)), Confidence: 0.9590  
Bounding Polygon: ((1907, 1251), (2157, 1251), (2157, 1274), (1907, 1276))  
Word: 'By', Bounding Polygon: ((1908, 1252), (1927, 1252), (1927, 1276), (1908, 1277)), Confidence: 0.8780  
Word: 'JOHN', Bounding Polygon: ((1937, 1252), (1984, 1253), (1984, 1274), (1937, 1276)), Confidence: 0.9880  
Word: 'NOBLE', Bounding Polygon: ((1995, 1253), (2057, 1253), (2058, 1273), (1996, 1274)), Confidence: 0.9960  
Word: 'WILFORD', Bounding Polygon: ((2067, 1253), (2151, 1252), (2153, 1273), (2068, 1272)), Confidence: 0.9890  
Bounding Polygon: ((2023, 1267), (2129, 1266), (2129, 1285), (2024, 1287))  
Word: 'New', Bounding Polygon: ((2030, 1268), (2056, 1267), (2056, 1287), (2031, 1287)), Confidence: 0.6610  
Word: 'York', Bounding Polygon: ((2060, 1267), (2088, 1267), (2088, 1286), (2060, 1287)), Confidence: 0.7340  
Word: 'Times', Bounding Polygon: ((2092, 1267), (2129, 1267), (2128, 1284), (2092, 1286)), Confidence: 0.5940  
Bounding Polygon: ((1925, 1274), (2136, 1274), (2136, 1292), (1925, 1293))  
Word: 'Special', Bounding Polygon: ((1944, 1275), (1985, 1275), (1986, 1294), (1945, 1294)), Confidence: 0.7470  
Word: 'to', Bounding Polygon: ((1989, 1275), (2003, 1275), (2003, 1294), (1989, 1294)), Confidence: 0.9960  
Word: 'The', Bounding Polygon: ((2006, 1275), (2027, 1275), (2028, 1293), (2007, 1294)), Confidence: 0.9980  
Word: 'New', Bounding Polygon: ((2031, 1275), (2056, 1275), (2057, 1293), (2031, 1293)), Confidence: 0.9510  
Word: 'York', Bounding Polygon: ((2060, 1275), (2089, 1276), (2090, 1292), (2061, 1293)), Confidence: 0.9920  
Word: 'Times', Bounding Polygon: ((2092, 1276), (2129, 1276), (2131, 1292), (2094, 1292)), Confidence: 0.8630  
Bounding Polygon: ((195, 1297), (647, 1302), (647, 1324), (195, 1319))  
Word: 'HOUSTON:', Bounding Polygon: ((200, 1298), (298, 1300), (298, 1321), (200, 1320)), Confidence: 0.9930  
Word: 'Roger,', Bounding Polygon: ((302, 1300), (361, 1301), (361, 1322), (302, 1321)), Confidence: 0.9890  
Word: 'Tranquility,', Bounding Polygon: ((365, 1301), (468, 1302), (468, 1323), (365, 1322)), Confidence: 0.9890  
Word: 'we', Bounding Polygon: ((472, 1302), (498, 1302), (498, 1323), (472, 1323)), Confidence: 0.9980  
Word: 'copy', Bounding Polygon: ((504, 1302), (544, 1302), (544, 1323), (504, 1323)), Confidence: 0.9870  
Word: 'you', Bounding Polygon: ((549, 1302), (582, 1303), (582, 1324), (549, 1323)), Confidence: 0.9980  
Word: 'on', Bounding Polygon: ((590, 1303), (610, 1302), (610, 1324), (590, 1324)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((618, 1302), (647, 1302), (647, 1324), (618, 1324)), Confidence: 0.9980  
Bounding Polygon: ((1796, 1292), (2300, 1289), (2300, 1313), (1796, 1316))  
Word: 'HOUSTON,', Bounding Polygon: ((1803, 1294), (1904, 1295), (1904, 1315), (1803, 1315)), Confidence: 0.9930  
Word: 'Monday,', Bounding Polygon: ((1911, 1295), (1991, 1295), (1991, 1315), (1911, 1315)), Confidence: 0.9930  
Word: 'July', Bounding Polygon: ((2000, 1295), (2036, 1294), (2036, 1315), (2000, 1315)), Confidence: 0.9870  
Word: '21-Men', Bounding Polygon: ((2048, 1294), (2124, 1293), (2124, 1315), (2048, 1315)), Confidence: 0.9890  
Word: 'have', Bounding Polygon: ((2136, 1293), (2178, 1292), (2178, 1315), (2136, 1315)), Confidence: 0.9910  
Word: 'landed', Bounding Polygon: ((2189, 1292), (2247, 1291), (2247, 1314), (2189, 1315)), Confidence: 0.9880  
Word: 'and', Bounding Polygon: ((2260, 1290), (2291, 1290), (2291, 1314), (2260, 1314)), Confidence: 0.9980  
Bounding Polygon: ((158, 1321), (651, 1324), (651, 1347), (158, 1345))  
Word: 'ground.', Bounding Polygon: ((161, 1321), (230, 1321), (229, 1346), (161, 1346)), Confidence: 0.9880  
Word: 'You've', Bounding Polygon: ((234, 1321), (295, 1321), (294, 1346), (234, 1346)), Confidence: 0.9840  
Word: 'got', Bounding Polygon: ((300, 1321), (329, 1322), (328, 1347), (299, 1346)), Confidence: 0.9960  
Word: 'a', Bounding Polygon: ((334, 1322), (345, 1322), (344, 1347), (332, 1347)), Confidence: 0.9950  
Word: 'bunch', Bounding Polygon: ((350, 1322), (403, 1322), (402, 1347), (349, 1347)), Confidence: 0.9950  
Word: 'of', Bounding Polygon: ((410, 1322), (430, 1323), (428, 1347), (408, 1347)), Confidence: 0.9980  
Word: 'guys', Bounding Polygon: ((434, 1323), (477, 1324), (475, 1347), (432, 1347)), Confidence: 0.9830  
Word: 'about', Bounding Polygon: ((481, 1324), (532, 1325), (529, 1347), (479, 1347)), Confidence: 0.9950  
Word: 'to', Bounding Polygon: ((536, 1325), (556, 1325), (553, 1347), (534, 1347)), Confidence: 0.9980  
Word: 'turn', Bounding Polygon: ((561, 1326), (599, 1327), (596, 1347), (558, 1347)), Confidence: 0.9880  
Word: 'blue.', Bounding Polygon: ((605, 1327), (651, 1328), (648, 1347), (602, 1347)), Confidence: 0.8520

Bounding Polygon: ((1760, 1318), (1960, 1320), (1960, 1339), (1760, 1338))  
Word: 'walked', Bounding Polygon: ((1766, 1318), (1829, 1320), (1827, 1338), (1765, 1338)), Confidence: 0.9950  
Word: 'on', Bounding Polygon: ((1838, 1320), (1858, 1320), (1855, 1338), (1835, 1338)), Confidence: 0.9970  
Word: 'the', Bounding Polygon: ((1868, 1320), (1895, 1321), (1893, 1338), (1865, 1338)), Confidence: 0.9990  
Word: 'moon.', Bounding Polygon: ((1903, 1321), (1960, 1322), (1957, 1339), (1900, 1338)), Confidence: 0.9930  
Bounding Polygon: ((160, 1342), (491, 1348), (490, 1371), (159, 1367))  
Word: 'We're', Bounding Polygon: ((163, 1343), (216, 1344), (215, 1369), (161, 1367)), Confidence: 0.9950  
Word: 'breathing', Bounding Polygon: ((221, 1344), (306, 1347), (305, 1370), (220, 1369)), Confidence: 0.9940  
Word: 'again.', Bounding Polygon: ((312, 1347), (369, 1348), (368, 1370), (311, 1370)), Confidence: 0.9500  
Word: 'Thanks', Bounding Polygon: ((374, 1348), (437, 1350), (437, 1371), (373, 1371)), Confidence: 0.9950  
Word: 'a', Bounding Polygon: ((442, 1350), (454, 1350), (454, 1371), (442, 1371)), Confidence: 0.9940  
Word: 'lot.', Bounding Polygon: ((462, 1350), (490, 1350), (490, 1371), (462, 1371)), Confidence: 0.9820  
Bounding Polygon: ((1802, 1342), (2295, 1337), (2295, 1359), (1802, 1364))  
Word: 'Two', Bounding Polygon: ((1806, 1342), (1843, 1342), (1843, 1364), (1806, 1364)), Confidence: 0.9960  
Word: 'Americans,', Bounding Polygon: ((1853, 1342), (1952, 1341), (1952, 1364), (1853, 1364)), Confidence: 0.9890  
Word: 'astronauts', Bounding Polygon: ((1956, 1341), (2051, 1340), (2050, 1363), (1956, 1364)), Confidence: 0.9930  
Word: 'of', Bounding Polygon: ((2055, 1340), (2078, 1340), (2077, 1362), (2055, 1362)), Confidence: 0.9980  
Word: 'Apollo', Bounding Polygon: ((2084, 1340), (2140, 1339), (2139, 1361), (2083, 1362)), Confidence: 0.9930  
Word: '11,', Bounding Polygon: ((2149, 1339), (2177, 1339), (2176, 1360), (2148, 1361)), Confidence: 0.9930  
Word: 'steered', Bounding Polygon: ((2181, 1339), (2243, 1338), (2242, 1358), (2180, 1360)), Confidence: 0.9940  
Word: 'their', Bounding Polygon: ((2251, 1338), (2295, 1337), (2293, 1357), (2249, 1358)), Confidence: 0.9950  
Bounding Polygon: ((202, 1372), (508, 1375), (507, 1400), (201, 1395))  
Word: 'TRANQUILITY', Bounding Polygon: ((203, 1373), (328, 1373), (327, 1395), (202, 1396)), Confidence: 0.9890  
Word: 'BASE:', Bounding Polygon: ((336, 1373), (394, 1374), (393, 1396), (335, 1395)), Confidence: 0.9880  
Word: 'Thank', Bounding Polygon: ((398, 1374), (451, 1376), (451, 1398), (398, 1396)), Confidence: 0.9950  
Word: 'you.', Bounding Polygon: ((459, 1376), (501, 1378), (501, 1400), (458, 1398)), Confidence: 0.9590  
Bounding Polygon: ((1761, 1365), (2296, 1362), (2296, 1384), (1761, 1388))  
Word: 'fragile', Bounding Polygon: ((1763, 1366), (1823, 1366), (1823, 1389), (1763, 1389)), Confidence: 0.9880  
Word: 'four-legged', Bounding Polygon: ((1832, 1365), (1933, 1364), (1933, 1388), (1832, 1389)), Confidence: 0.9930  
Word: 'lunar', Bounding Polygon: ((1943, 1364), (1993, 1363), (1993, 1387), (1943, 1388)), Confidence: 0.9940  
Word: 'module', Bounding Polygon: ((2001, 1363), (2068, 1363), (2068, 1387), (2001, 1387)), Confidence: 0.9930  
Word: 'safely', Bounding Polygon: ((2076, 1363), (2129, 1362), (2129, 1386), (2076, 1387)), Confidence: 0.9950  
Word: 'and', Bounding Polygon: ((2139, 1362), (2172, 1362), (2172, 1386), (2139, 1386)), Confidence: 0.9940  
Word: 'smoothly', Bounding Polygon: ((2183, 1362), (2264, 1362), (2264, 1385), (2183, 1386)), Confidence: 0.9930  
Word: 'to', Bounding Polygon: ((2274, 1362), (2293, 1362), (2293, 1385), (2274, 1385)), Confidence: 0.9980  
Bounding Polygon: ((203, 1396), (538, 1397), (538, 1421), (203, 1420))  
Word: 'HOUSTON:', Bounding Polygon: ((203, 1396), (302, 1398), (301, 1421), (203, 1420)), Confidence: 0.9930  
Word: 'You're', Bounding Polygon: ((306, 1398), (364, 1399), (363, 1421), (305, 1421)), Confidence: 0.9840  
Word: 'looking', Bounding Polygon: ((371, 1399), (438, 1399), (435, 1421), (369, 1421)), Confidence: 0.9940  
Word: 'good', Bounding Polygon: ((447, 1399), (489, 1399), (486, 1421), (445, 1421)), Confidence: 0.9910  
Word: 'here.', Bounding Polygon: ((496, 1399), (538, 1398), (535, 1421), (494, 1421)), Confidence: 0.9210  
Bounding Polygon: ((1762, 1389), (2294, 1383), (2294, 1406), (1762, 1411))  
Word: 'the', Bounding Polygon: ((1764, 1389), (1793, 1389), (1791, 1410), (1762, 1409)), Confidence: 0.9990  
Word: 'historic', Bounding Polygon: ((1800, 1389), (1868, 1389), (1866, 1410), (1799, 1410)), Confidence: 0.9940  
Word: 'landing', Bounding Polygon: ((1874, 1389), (1940, 1388), (1938, 1410), (1872, 1410)), Confidence: 0.9940  
Word: 'yesterday', Bounding Polygon: ((1946, 1388), (2030, 1387), (2029, 1410), (1944, 1410)), Confidence: 0.9940  
Word: 'at', Bounding Polygon: ((2039, 1387), (2060, 1387), (2058, 1409), (2038, 1410)), Confidence: 0.9980  
Word: '4:17:40', Bounding Polygon: ((2065, 1387), (2125, 1386), (2123, 1408), (2063, 1409)), Confidence: 0.9930  
Word: 'P.M.,', Bounding Polygon: ((2132, 1386), (2178, 1385), (2176, 1407), (2131, 1408)), Confidence: 0.9690  
Word: 'Eastern', Bounding Polygon: ((2182, 1385), (2246, 1384), (2245, 1405), (2180, 1407)), Confidence: 0.9940  
Word: 'day-', Bounding Polygon: ((2255, 1384), (2293, 1384), (2292, 1404), (2254, 1405)), Confidence: 0.9890  
Bounding Polygon: ((203, 1418), (641, 1422), (641, 1444), (202, 1439))  
Word: 'TRANQUILITY', Bounding Polygon: ((204, 1419), (327, 1419), (326, 1441), (203, 1439)), Confidence: 0.9750  
Word: 'BASE:', Bounding Polygon: ((336, 1419), (393, 1419), (392, 1442), (335, 1441)), Confidence: 0.9930  
Word: 'A', Bounding Polygon: ((398, 1419), (411, 1419), (409, 1442), (397, 1442)), Confidence: 0.9650  
Word: 'very', Bounding Polygon: ((420, 1420), (459, 1420), (458, 1443), (418, 1442)), Confidence: 0.9930

Word: 'smooth', Bounding Polygon: ((467, 1420), (530, 1421), (528, 1444), (465, 1443)), Confidence: 0.9940  
Word: 'touchdown.', Bounding Polygon: ((539, 1421), (641, 1424), (639, 1445), (537, 1444)), Confidence: 0.9930  
Bounding Polygon: ((1763, 1411), (1860, 1411), (1860, 1432), (1763, 1433))  
Word: 'light', Bounding Polygon: ((1764, 1412), (1807, 1413), (1807, 1433), (1764, 1434)), Confidence: 0.9960  
Word: 'time.', Bounding Polygon: ((1813, 1413), (1860, 1412), (1860, 1431), (1813, 1433)), Confidence: 0.9940  
Bounding Polygon: ((198, 1440), (648, 1445), (648, 1468), (198, 1463))  
Word: 'HOUSTON:', Bounding Polygon: ((200, 1441), (301, 1442), (300, 1465), (200, 1461)), Confidence: 0.9900  
Word: 'Eagle,', Bounding Polygon: ((305, 1442), (361, 1442), (360, 1466), (305, 1465)), Confidence: 0.9930  
Word: 'you', Bounding Polygon: ((365, 1442), (399, 1443), (398, 1467), (365, 1466)), Confidence: 0.9940  
Word: 'are', Bounding Polygon: ((408, 1443), (437, 1443), (436, 1467), (407, 1467)), Confidence: 0.9980  
Word: 'stay', Bounding Polygon: ((446, 1443), (482, 1444), (481, 1467), (445, 1467)), Confidence: 0.9910  
Word: 'for', Bounding Polygon: ((490, 1444), (520, 1444), (519, 1468), (489, 1467)), Confidence: 0.9980  
Word: 'Tl.', Bounding Polygon: ((528, 1445), (557, 1445), (556, 1467), (527, 1468)), Confidence: 0.7180  
Word: '[The', Bounding Polygon: ((561, 1445), (604, 1446), (602, 1467), (560, 1467)), Confidence: 0.9830  
Word: 'first', Bounding Polygon: ((610, 1446), (648, 1447), (646, 1467), (608, 1467)), Confidence: 0.9930  
Bounding Polygon: ((1798, 1435), (2295, 1433), (2295, 1454), (1798, 1458))  
Word: 'Neil', Bounding Polygon: ((1801, 1438), (1841, 1437), (1843, 1458), (1803, 1458)), Confidence: 0.9890  
Word: 'A.', Bounding Polygon: ((1846, 1437), (1867, 1436), (1868, 1457), (1847, 1458)), Confidence: 0.9900  
Word: 'Armstrong,', Bounding Polygon: ((1873, 1436), (1971, 1435), (1972, 1457), (1874, 1457)), Confidence: 0.9940  
Word: 'the', Bounding Polygon: ((1976, 1435), (2005, 1434), (2006, 1457), (1977, 1457)), Confidence: 0.9990  
Word: '38-year-old', Bounding Polygon: ((2011, 1434), (2108, 1434), (2109, 1456), (2012, 1457)), Confidence: 0.6730  
Word: 'civilian', Bounding Polygon: ((2116, 1433), (2178, 1433), (2179, 1456), (2116, 1456)), Confidence: 0.9910  
Word: 'commander,', Bounding Polygon: ((2187, 1433), (2294, 1433), (2294, 1455), (2187, 1456)), Confidence: 0.9940  
Bounding Polygon: ((162, 1462), (483, 1465), (483, 1490), (162, 1488))  
Word: 'step', Bounding Polygon: ((164, 1463), (200, 1464), (200, 1489), (164, 1489)), Confidence: 0.9870  
Word: 'in', Bounding Polygon: ((207, 1464), (227, 1465), (226, 1490), (207, 1489)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((233, 1465), (264, 1466), (263, 1490), (233, 1490)), Confidence: 0.9980  
Word: 'lunar', Bounding Polygon: ((270, 1466), (319, 1467), (319, 1490), (270, 1490)), Confidence: 0.9930  
Word: 'operation. ]', Bounding Polygon: ((324, 1467), (422, 1468), (420, 1490), (324, 1490)), Confidence: 0.9750  
Word: 'Over.', Bounding Polygon: ((426, 1468), (478, 1467), (477, 1490), (425, 1490)), Confidence: 0.9940  
Bounding Polygon: ((1762, 1459), (2226, 1456), (2226, 1478), (1762, 1481))  
Word: 'radioed', Bounding Polygon: ((1762, 1460), (1828, 1460), (1828, 1481), (1762, 1482)), Confidence: 0.9920  
Word: 'to', Bounding Polygon: ((1834, 1460), (1853, 1459), (1853, 1481), (1834, 1481)), Confidence: 0.9920  
Word: 'earth', Bounding Polygon: ((1859, 1459), (1904, 1459), (1903, 1480), (1859, 1481)), Confidence: 0.9960  
Word: 'and', Bounding Polygon: ((1911, 1459), (1943, 1459), (1942, 1480), (1910, 1480)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((1949, 1459), (1978, 1459), (1978, 1479), (1948, 1480)), Confidence: 0.9980  
Word: 'mission', Bounding Polygon: ((1983, 1459), (2050, 1458), (2049, 1479), (1982, 1479)), Confidence: 0.9930  
Word: 'control', Bounding Polygon: ((2056, 1458), (2120, 1457), (2119, 1479), (2055, 1479)), Confidence: 0.9930  
Word: 'room', Bounding Polygon: ((2124, 1457), (2163, 1457), (2162, 1479), (2123, 1479)), Confidence: 0.9930  
Word: 'here:', Bounding Polygon: ((2175, 1457), (2224, 1457), (2222, 1479), (2174, 1479)), Confidence: 0.9940  
Bounding Polygon: ((183, 1485), (580, 1491), (580, 1513), (183, 1509))  
Word: 'TRANQUILITY', Bounding Polygon: ((202, 1486), (326, 1488), (327, 1511), (204, 1510)), Confidence: 0.9930  
Word: 'BASE:', Bounding Polygon: ((336, 1488), (394, 1489), (396, 1511), (338, 1511)), Confidence: 0.9790  
Word: 'Roger.', Bounding Polygon: ((400, 1489), (460, 1491), (461, 1511), (402, 1511)), Confidence: 0.9930  
Word: 'Stay', Bounding Polygon: ((466, 1491), (505, 1492), (507, 1512), (467, 1511)), Confidence: 0.9890  
Word: 'for', Bounding Polygon: ((514, 1492), (544, 1493), (545, 1512), (516, 1512)), Confidence: 0.9930  
Word: 'TI.', Bounding Polygon: ((551, 1493), (578, 1493), (580, 1512), (553, 1512)), Confidence: 0.5780  
Bounding Polygon: ((1803, 1483), (2292, 1475), (2292, 1498), (1803, 1506))  
Word: '"Houston,', Bounding Polygon: ((1805, 1484), (1893, 1483), (1891, 1505), (1804, 1506)), Confidence: 0.9400  
Word: 'Tranquility', Bounding Polygon: ((1897, 1483), (1992, 1481), (1991, 1504), (1896, 1505)), Confidence: 0.9900  
Word: 'Base', Bounding Polygon: ((1996, 1481), (2037, 1480), (2036, 1503), (1995, 1504)), Confidence: 0.9890  
Word: 'here.', Bounding Polygon: ((2041, 1480), (2088, 1480), (2087, 1502), (2041, 1503)), Confidence: 0.9940  
Word: 'The', Bounding Polygon: ((2092, 1480), (2124, 1479), (2124, 1501), (2092, 1502)), Confidence: 0.9980  
Word: 'Eagle', Bounding Polygon: ((2129, 1479), (2177, 1478), (2177, 1500), (2128, 1501)), Confidence: 0.9940  
Word: 'has', Bounding Polygon: ((2181, 1478), (2213, 1477), (2213, 1499), (2181, 1500)), Confidence: 0.9860  
Word: 'landed."', Bounding Polygon: ((2218, 1477), (2290, 1475), (2290, 1497), (2218, 1499)), Confidence: 0.8810

Bounding Polygon: ((197, 1509), (650, 1516), (650, 1537), (197, 1532))  
Word: 'HOUSTON:', Bounding Polygon: ((202, 1510), (301, 1511), (301, 1534), (202, 1533)), Confidence: 0.9940  
Word: 'Roger', Bounding Polygon: ((305, 1511), (359, 1512), (358, 1535), (305, 1534)), Confidence: 0.9950  
Word: 'and', Bounding Polygon: ((364, 1513), (396, 1513), (395, 1535), (364, 1535)), Confidence: 0.9980  
Word: 'we', Bounding Polygon: ((404, 1513), (430, 1514), (430, 1535), (404, 1535)), Confidence: 0.9980  
Word: 'see', Bounding Polygon: ((438, 1514), (466, 1514), (465, 1535), (437, 1535)), Confidence: 0.9980  
Word: 'you', Bounding Polygon: ((472, 1515), (505, 1515), (504, 1536), (471, 1536)), Confidence: 0.9940  
Word: 'venting', Bounding Polygon: ((513, 1515), (579, 1517), (578, 1536), (512, 1536)), Confidence: 0.9950  
Word: 'the', Bounding Polygon: ((587, 1517), (615, 1518), (614, 1536), (585, 1536)), Confidence: 0.9980  
Word: 'ox.', Bounding Polygon: ((622, 1518), (650, 1519), (648, 1536), (621, 1536)), Confidence: 0.8310  
Bounding Polygon: ((1804, 1506), (2296, 1499), (2296, 1523), (1804, 1529))  
Word: 'The', Bounding Polygon: ((1805, 1507), (1836, 1507), (1836, 1529), (1805, 1529)), Confidence: 0.9870  
Word: 'first', Bounding Polygon: ((1842, 1507), (1882, 1506), (1882, 1529), (1842, 1529)), Confidence: 0.9950  
Word: 'men', Bounding Polygon: ((1887, 1506), (1925, 1506), (1926, 1528), (1887, 1529)), Confidence: 0.9980  
Word: 'to', Bounding Polygon: ((1933, 1506), (1952, 1505), (1952, 1528), (1933, 1528)), Confidence: 0.9980  
Word: 'reach', Bounding Polygon: ((1958, 1505), (2007, 1505), (2008, 1527), (1959, 1528)), Confidence: 0.9960  
Word: 'the', Bounding Polygon: ((2015, 1505), (2045, 1504), (2045, 1527), (2016, 1527)), Confidence: 0.9930  
Word: 'moon-Mr.', Bounding Polygon: ((2051, 1504), (2152, 1502), (2153, 1525), (2052, 1527)), Confidence: 0.9930  
Word: 'Armstrong', Bounding Polygon: ((2157, 1502), (2251, 1501), (2252, 1524), (2158, 1525)), Confidence: 0.9930  
Word: 'and', Bounding Polygon: ((2257, 1501), (2289, 1500), (2291, 1523), (2258, 1524)), Confidence: 0.9990  
Bounding Polygon: ((201, 1533), (459, 1537), (459, 1560), (201, 1557))  
Word: 'TRANQUILITY', Bounding Polygon: ((203, 1534), (327, 1535), (327, 1558), (203, 1557)), Confidence: 0.9940  
Word: 'BASE:', Bounding Polygon: ((338, 1535), (396, 1537), (396, 1559), (338, 1558)), Confidence: 0.9940  
Word: 'Roger.', Bounding Polygon: ((402, 1538), (459, 1541), (459, 1560), (402, 1559)), Confidence: 0.9930  
Bounding Polygon: ((1761, 1529), (2295, 1522), (2295, 1547), (1761, 1552))  
Word: 'his', Bounding Polygon: ((1763, 1531), (1792, 1530), (1791, 1550), (1762, 1549)), Confidence: 0.9970  
Word: 'co-pilot,', Bounding Polygon: ((1800, 1530), (1877, 1529), (1875, 1551), (1799, 1550)), Confidence: 0.9900  
Word: 'Col.', Bounding Polygon: ((1882, 1529), (1921, 1529), (1920, 1551), (1880, 1551)), Confidence: 0.9910  
Word: 'Edwin', Bounding Polygon: ((1926, 1529), (1982, 1528), (1980, 1551), (1924, 1551)), Confidence: 0.9960  
Word: 'E.', Bounding Polygon: ((1991, 1528), (2014, 1527), (2013, 1551), (1990, 1551)), Confidence: 0.9930  
Word: 'Aldrin', Bounding Polygon: ((2021, 1527), (2075, 1526), (2074, 1551), (2019, 1551)), Confidence: 0.9940  
Word: 'Jr.', Bounding Polygon: ((2084, 1526), (2112, 1526), (2111, 1550), (2083, 1550)), Confidence: 0.9920  
Word: 'of', Bounding Polygon: ((2117, 1526), (2139, 1525), (2137, 1549), (2115, 1550)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((2145, 1525), (2176, 1525), (2174, 1548), (2143, 1549)), Confidence: 0.9980  
Word: 'Air', Bounding Polygon: ((2185, 1524), (2216, 1524), (2214, 1547), (2183, 1548)), Confidence: 0.9940  
Word: 'Force-', Bounding Polygon: ((2223, 1524), (2282, 1523), (2281, 1545), (2222, 1547)), Confidence: 0.9320  
Bounding Polygon: ((199, 1559), (651, 1561), (651, 1582), (199, 1580))  
Word: 'COLUMBIA', Bounding Polygon: ((202, 1560), (299, 1560), (300, 1580), (203, 1580)), Confidence: 0.9930  
Word: '(the', Bounding Polygon: ((313, 1560), (348, 1560), (349, 1580), (314, 1580)), Confidence: 0.9640  
Word: 'command', Bounding Polygon: ((360, 1560), (442, 1560), (443, 1581), (361, 1580)), Confidence: 0.9940  
Word: 'and', Bounding Polygon: ((456, 1560), (487, 1561), (488, 1581), (457, 1581)), Confidence: 0.9980  
Word: 'service', Bounding Polygon: ((501, 1561), (563, 1561), (563, 1582), (501, 1581)), Confidence: 0.9940  
Word: 'module):', Bounding Polygon: ((574, 1561), (651, 1561), (651, 1583), (574, 1582)), Confidence: 0.9890  
Bounding Polygon: ((1763, 1551), (2297, 1547), (2297, 1570), (1763, 1576))  
Word: 'brought', Bounding Polygon: ((1764, 1552), (1833, 1552), (1833, 1575), (1764, 1576)), Confidence: 0.9940  
Word: 'their', Bounding Polygon: ((1837, 1552), (1882, 1551), (1881, 1575), (1837, 1575)), Confidence: 0.9940  
Word: 'ship', Bounding Polygon: ((1886, 1551), (1922, 1551), (1922, 1574), (1886, 1575)), Confidence: 0.9930  
Word: 'to', Bounding Polygon: ((1929, 1551), (1948, 1551), (1947, 1574), (1928, 1574)), Confidence: 0.9980  
Word: 'rest', Bounding Polygon: ((1954, 1551), (1991, 1551), (1990, 1573), (1953, 1574)), Confidence: 0.9920  
Word: 'on', Bounding Polygon: ((1995, 1551), (2017, 1551), (2016, 1573), (1994, 1573)), Confidence: 0.9980  
Word: 'a', Bounding Polygon: ((2023, 1551), (2034, 1551), (2034, 1572), (2022, 1573)), Confidence: 0.9940  
Word: 'level,', Bounding Polygon: ((2039, 1551), (2089, 1550), (2088, 1572), (2038, 1572)), Confidence: 0.9900  
Word: 'rock-strewn', Bounding Polygon: ((2094, 1550), (2197, 1549), (2195, 1571), (2093, 1572)), Confidence: 0.9920  
Word: 'plain', Bounding Polygon: ((2204, 1549), (2247, 1548), (2245, 1570), (2203, 1570)), Confidence: 0.9960  
Word: 'near', Bounding Polygon: ((2253, 1548), (2295, 1548), (2294, 1570), (2251, 1570)), Confidence: 0.9860  
Bounding Polygon: ((162, 1579), (354, 1582), (354, 1605), (162, 1601))

Word: 'How', Bounding Polygon: ((162, 1579), (197, 1580), (197, 1603), (162, 1602)), Confidence: 0.9940  
Word: 'do', Bounding Polygon: ((206, 1580), (229, 1581), (229, 1603), (206, 1603)), Confidence: 0.9890  
Word: 'you', Bounding Polygon: ((234, 1581), (266, 1582), (266, 1604), (234, 1603)), Confidence: 0.9980  
Word: 'read', Bounding Polygon: ((271, 1582), (310, 1582), (310, 1604), (271, 1604)), Confidence: 0.9920  
Word: 'me?', Bounding Polygon: ((315, 1582), (354, 1583), (354, 1605), (315, 1604)), Confidence: 0.9890  
Bounding Polygon: ((1760, 1576), (2244, 1571), (2245, 1594), (1760, 1598))  
Word: 'the', Bounding Polygon: ((1762, 1577), (1791, 1577), (1791, 1598), (1762, 1598)), Confidence: 0.9980  
Word: 'southwestern', Bounding Polygon: ((1798, 1576), (1914, 1575), (1914, 1598), (1797, 1598)), Confidence: 0.9940  
Word: 'shore', Bounding Polygon: ((1922, 1575), (1970, 1574), (1970, 1597), (1921, 1598)), Confidence: 0.9960  
Word: 'of', Bounding Polygon: ((1977, 1574), (1997, 1574), (1997, 1597), (1976, 1597)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((2002, 1574), (2031, 1574), (2030, 1597), (2001, 1597)), Confidence: 0.9990  
Word: 'arid', Bounding Polygon: ((2037, 1574), (2072, 1573), (2071, 1596), (2036, 1597)), Confidence: 0.9910  
Word: 'Sea', Bounding Polygon: ((2080, 1573), (2111, 1573), (2110, 1596), (2079, 1596)), Confidence: 0.9980  
Word: 'of', Bounding Polygon: ((2117, 1573), (2138, 1573), (2137, 1596), (2116, 1596)), Confidence: 0.9920  
Word: 'Tranquility.', Bounding Polygon: ((2142, 1573), (2245, 1572), (2243, 1594), (2141, 1596)), Confidence: 0.9910  
Bounding Polygon: ((197, 1603), (650, 1604), (650, 1628), (197, 1626))  
Word: 'HOUSTON:', Bounding Polygon: ((202, 1603), (302, 1603), (302, 1627), (202, 1627)), Confidence: 0.9930  
Word: 'Columbia,', Bounding Polygon: ((309, 1603), (401, 1603), (401, 1627), (309, 1627)), Confidence: 0.9890  
Word: 'he', Bounding Polygon: ((408, 1603), (431, 1603), (431, 1627), (408, 1627)), Confidence: 0.9950  
Word: 'has', Bounding Polygon: ((441, 1604), (475, 1604), (475, 1628), (441, 1628)), Confidence: 0.9940  
Word: 'landed', Bounding Polygon: ((481, 1604), (542, 1604), (542, 1628), (481, 1628)), Confidence: 0.9930  
Word: 'Tranquility', Bounding Polygon: ((554, 1604), (651, 1605), (651, 1629), (554, 1628)), Confidence: 0.9940  
Bounding Polygon: ((1796, 1598), (2290, 1592), (2290, 1617), (1796, 1622))  
Word: 'About', Bounding Polygon: ((1803, 1599), (1856, 1599), (1856, 1622), (1803, 1621)), Confidence: 0.9950  
Word: 'six', Bounding Polygon: ((1860, 1599), (1887, 1599), (1887, 1622), (1860, 1622)), Confidence: 0.9930  
Word: 'and', Bounding Polygon: ((1892, 1599), (1925, 1599), (1925, 1622), (1892, 1622)), Confidence: 0.9970  
Word: 'a', Bounding Polygon: ((1931, 1599), (1942, 1599), (1942, 1622), (1931, 1622)), Confidence: 0.9970  
Word: 'half', Bounding Polygon: ((1946, 1599), (1982, 1599), (1982, 1622), (1946, 1622)), Confidence: 0.9910  
Word: 'hours', Bounding Polygon: ((1987, 1598), (2037, 1598), (2037, 1621), (1987, 1622)), Confidence: 0.9950  
Word: 'later,', Bounding Polygon: ((2041, 1598), (2090, 1597), (2090, 1620), (2041, 1621)), Confidence: 0.9930  
Word: 'Mr.', Bounding Polygon: ((2094, 1597), (2126, 1596), (2126, 1620), (2094, 1620)), Confidence: 0.9950  
Word: 'Armstrong', Bounding Polygon: ((2130, 1596), (2224, 1594), (2224, 1618), (2130, 1620)), Confidence: 0.9940  
Word: 'opened', Bounding Polygon: ((2228, 1594), (2290, 1592), (2290, 1616), (2228, 1618)), Confidence: 0.9940  
Bounding Polygon: ((163, 1625), (654, 1629), (653, 1653), (163, 1650))  
Word: 'Base,', Bounding Polygon: ((164, 1626), (214, 1627), (214, 1651), (164, 1650)), Confidence: 0.6690  
Word: 'Eagle', Bounding Polygon: ((223, 1627), (271, 1628), (271, 1651), (223, 1651)), Confidence: 0.9940  
Word: 'is', Bounding Polygon: ((282, 1628), (300, 1629), (301, 1652), (282, 1651)), Confidence: 0.9970  
Word: 'at', Bounding Polygon: ((311, 1629), (333, 1629), (333, 1652), (312, 1652)), Confidence: 0.9980  
Word: 'Tranquility.', Bounding Polygon: ((343, 1629), (448, 1631), (448, 1652), (344, 1652)), Confidence: 0.9900  
Word: 'I', Bounding Polygon: ((455, 1631), (468, 1631), (469, 1652), (456, 1652)), Confidence: 0.8840  
Word: 'read', Bounding Polygon: ((477, 1631), (517, 1631), (518, 1652), (478, 1652)), Confidence: 0.9920  
Word: 'you', Bounding Polygon: ((529, 1631), (562, 1631), (564, 1652), (530, 1652)), Confidence: 0.9980  
Word: 'five', Bounding Polygon: ((575, 1631), (611, 1631), (612, 1652), (576, 1652)), Confidence: 0.9890  
Word: 'by.', Bounding Polygon: ((623, 1631), (653, 1630), (654, 1652), (625, 1652)), Confidence: 0.9870  
Bounding Polygon: ((1763, 1622), (2295, 1615), (2295, 1639), (1763, 1646))  
Word: 'the', Bounding Polygon: ((1763, 1622), (1792, 1622), (1792, 1646), (1763, 1647)), Confidence: 0.9980  
Word: 'landing', Bounding Polygon: ((1798, 1622), (1865, 1622), (1865, 1645), (1798, 1646)), Confidence: 0.9940  
Word: 'craft's', Bounding Polygon: ((1872, 1622), (1931, 1621), (1931, 1645), (1872, 1645)), Confidence: 0.9930  
Word: 'hatch,', Bounding Polygon: ((1936, 1621), (1995, 1621), (1995, 1644), (1936, 1644)), Confidence: 0.9940  
Word: 'stepped', Bounding Polygon: ((2000, 1621), (2067, 1620), (2067, 1643), (2000, 1644)), Confidence: 0.9950  
Word: 'slowly', Bounding Polygon: ((2077, 1620), (2133, 1619), (2132, 1642), (2076, 1642)), Confidence: 0.9940  
Word: 'down', Bounding Polygon: ((2143, 1619), (2190, 1618), (2189, 1641), (2142, 1641)), Confidence: 0.9930  
Word: 'the', Bounding Polygon: ((2198, 1618), (2228, 1617), (2227, 1640), (2197, 1641)), Confidence: 0.9980  
Word: 'ladder', Bounding Polygon: ((2235, 1617), (2294, 1616), (2292, 1639), (2233, 1640)), Confidence: 0.9950  
Bounding Polygon: ((168, 1652), (211, 1652), (211, 1669), (168, 1670))  
Word: 'Over.', Bounding Polygon: ((168, 1652), (210, 1652), (210, 1670), (168, 1670)), Confidence: 0.9820

Bounding Polygon: ((1760, 1646), (2293, 1637), (2293, 1660), (1760, 1670))  
Word: 'and.', Bounding Polygon: ((1762, 1648), (1800, 1647), (1800, 1669), (1762, 1670)), Confidence: 0.9170  
Word: 'declared', Bounding Polygon: ((1805, 1647), (1879, 1646), (1879, 1668), (1805, 1669)), Confidence: 0.7740  
Word: 'as', Bounding Polygon: ((1888, 1646), (1911, 1646), (1911, 1668), (1888, 1668)), Confidence: 0.9910  
Word: 'he', Bounding Polygon: ((1919, 1646), (1940, 1646), (1940, 1667), (1919, 1668)), Confidence: 0.9950  
Word: 'planted', Bounding Polygon: ((1950, 1645), (2015, 1644), (2015, 1666), (1950, 1667)), Confidence: 0.9940  
Word: 'the', Bounding Polygon: ((2026, 1644), (2055, 1644), (2055, 1665), (2026, 1666)), Confidence: 0.9980  
Word: 'first', Bounding Polygon: ((2062, 1643), (2104, 1642), (2104, 1665), (2062, 1665)), Confidence: 0.9880  
Word: 'human', Bounding Polygon: ((2111, 1642), (2170, 1641), (2170, 1663), (2111, 1664)), Confidence: 0.9940  
Word: 'footprint', Bounding Polygon: ((2179, 1641), (2261, 1638), (2261, 1662), (2179, 1663)), Confidence: 0.9910  
Word: 'on', Bounding Polygon: ((2269, 1638), (2290, 1637), (2290, 1661), (2269, 1662)), Confidence: 0.9980  
Bounding Polygon: ((200, 1672), (579, 1674), (579, 1696), (200, 1694))  
Word: 'COLUMBIA:', Bounding Polygon: ((200, 1674), (308, 1673), (308, 1695), (200, 1695)), Confidence: 0.9590  
Word: 'Yes,', Bounding Polygon: ((313, 1673), (353, 1673), (353, 1696), (313, 1696)), Confidence: 0.9810  
Word: 'I', Bounding Polygon: ((357, 1673), (368, 1673), (368, 1696), (357, 1696)), Confidence: 0.9940  
Word: 'heard', Bounding Polygon: ((372, 1673), (422, 1673), (422, 1696), (372, 1696)), Confidence: 0.9930  
Word: 'the', Bounding Polygon: ((431, 1673), (460, 1674), (460, 1696), (431, 1696)), Confidence: 0.9980  
Word: 'whole', Bounding Polygon: ((468, 1674), (522, 1674), (522, 1697), (468, 1697)), Confidence: 0.9980  
Word: 'thing.', Bounding Polygon: ((528, 1674), (579, 1675), (579, 1697), (528, 1697)), Confidence: 0.9950  
Bounding Polygon: ((1760, 1667), (1909, 1668), (1909, 1692), (1760, 1691))  
Word: 'the', Bounding Polygon: ((1762, 1668), (1791, 1669), (1792, 1692), (1762, 1692)), Confidence: 0.9980  
Word: 'lunar', Bounding Polygon: ((1796, 1669), (1844, 1670), (1845, 1692), (1796, 1692)), Confidence: 0.6710  
Word: 'crust:', Bounding Polygon: ((1849, 1670), (1904, 1671), (1906, 1691), (1850, 1692)), Confidence: 0.9560  
Bounding Polygon: ((201, 1695), (523, 1700), (522, 1723), (201, 1717))  
Word: 'HOUSTON:', Bounding Polygon: ((202, 1695), (303, 1697), (303, 1720), (203, 1718)), Confidence: 0.9930  
Word: 'Well,', Bounding Polygon: ((308, 1697), (356, 1697), (355, 1720), (308, 1720)), Confidence: 0.9930  
Word: 'it's', Bounding Polygon: ((360, 1697), (391, 1698), (390, 1721), (359, 1721)), Confidence: 0.9890  
Word: 'a', Bounding Polygon: ((397, 1698), (409, 1698), (408, 1721), (396, 1721)), Confidence: 0.9960  
Word: 'good', Bounding Polygon: ((418, 1699), (460, 1700), (458, 1722), (417, 1722)), Confidence: 0.9920  
Word: 'show.', Bounding Polygon: ((471, 1700), (523, 1701), (520, 1723), (468, 1722)), Confidence: 0.9930  
Bounding Polygon: ((1793, 1690), (2294, 1683), (2295, 1710), (1793, 1716))  
Word: '"That's', Bounding Polygon: ((1800, 1693), (1869, 1692), (1868, 1715), (1800, 1716)), Confidence: 0.9360  
Word: 'one', Bounding Polygon: ((1875, 1692), (1910, 1692), (1910, 1715), (1875, 1715)), Confidence: 0.9970  
Word: 'small', Bounding Polygon: ((1920, 1692), (1972, 1691), (1972, 1715), (1920, 1715)), Confidence: 0.9950  
Word: 'step', Bounding Polygon: ((1978, 1691), (2016, 1691), (2015, 1714), (1977, 1715)), Confidence: 0.9910  
Word: 'for', Bounding Polygon: ((2026, 1691), (2055, 1690), (2055, 1714), (2025, 1714)), Confidence: 0.9980  
Word: 'man,', Bounding Polygon: ((2062, 1690), (2111, 1689), (2110, 1713), (2061, 1714)), Confidence: 0.9900  
Word: 'one', Bounding Polygon: ((2118, 1689), (2151, 1688), (2150, 1713), (2117, 1713)), Confidence: 0.9970  
Word: 'giant', Bounding Polygon: ((2161, 1687), (2210, 1686), (2209, 1712), (2160, 1713)), Confidence: 0.9940  
Word: 'leap', Bounding Polygon: ((2216, 1686), (2254, 1685), (2252, 1711), (2214, 1712)), Confidence: 0.9920  
Word: 'for', Bounding Polygon: ((2264, 1684), (2294, 1683), (2292, 1710), (2262, 1711)), Confidence: 0.9980  
Bounding Polygon: ((198, 1718), (404, 1720), (404, 1742), (198, 1740))  
Word: 'COLUMBIA:', Bounding Polygon: ((201, 1718), (309, 1719), (309, 1740), (200, 1740)), Confidence: 0.9920  
Word: 'Fantastic.', Bounding Polygon: ((318, 1720), (405, 1723), (405, 1742), (317, 1740)), Confidence: 0.9930  
Bounding Polygon: ((1760, 1718), (1856, 1717), (1857, 1738), (1760, 1741))  
Word: 'mankind.', Bounding Polygon: ((1762, 1719), (1853, 1718), (1851, 1738), (1761, 1741)), Confidence: 0.9520  
Bounding Polygon: ((200, 1741), (541, 1742), (541, 1765), (200, 1764))  
Word: 'TRANQUILITY', Bounding Polygon: ((203, 1742), (328, 1742), (327, 1765), (202, 1764)), Confidence: 0.9360  
Word: 'BASE:', Bounding Polygon: ((336, 1742), (393, 1742), (392, 1766), (336, 1765)), Confidence: 0.9820  
Word: 'I'll', Bounding Polygon: ((398, 1742), (427, 1742), (426, 1766), (397, 1766)), Confidence: 0.8810  
Word: 'second', Bounding Polygon: ((431, 1742), (491, 1743), (491, 1766), (431, 1766)), Confidence: 0.9930  
Word: 'that.', Bounding Polygon: ((499, 1743), (540, 1743), (540, 1766), (499, 1766)), Confidence: 0.9930  
Bounding Polygon: ((1795, 1741), (2291, 1730), (2292, 1753), (1795, 1765))  
Word: 'His', Bounding Polygon: ((1803, 1741), (1835, 1740), (1834, 1765), (1801, 1766)), Confidence: 0.9960  
Word: 'first', Bounding Polygon: ((1840, 1740), (1882, 1740), (1881, 1764), (1839, 1765)), Confidence: 0.9940  
Word: 'step', Bounding Polygon: ((1887, 1740), (1924, 1739), (1923, 1763), (1886, 1764)), Confidence: 0.9910

Word: 'on', Bounding Polygon: ((1933, 1739), (1955, 1739), (1954, 1762), (1933, 1763)), Confidence: 0.9980  
Word: 'the', Bounding Polygon: ((1964, 1738), (1994, 1738), (1994, 1761), (1964, 1762)), Confidence: 0.9980  
Word: 'moon', Bounding Polygon: ((2001, 1738), (2050, 1737), (2050, 1760), (2001, 1761)), Confidence: 0.9930  
Word: 'came', Bounding Polygon: ((2058, 1737), (2106, 1735), (2107, 1758), (2058, 1760)), Confidence: 0.9920  
Word: 'at-', Bounding Polygon: ((2113, 1735), (2136, 1735), (2137, 1757), (2113, 1758)), Confidence: 0.6090  
Word: '10:56:20', Bounding Polygon: ((2141, 1735), (2211, 1733), (2212, 1755), (2141, 1757)), Confidence: 0.9930  
Word: 'P.M.', Bounding Polygon: ((2219, 1732), (2265, 1731), (2266, 1754), (2220, 1755)), Confidence: 0.9890  
Word: 'as', Bounding Polygon: ((2269, 1731), (2291, 1730), (2292, 1753), (2271, 1754)), Confidence: 0.9930  
Bounding Polygon: ((197, 1765), (653, 1766), (653, 1792), (197, 1791))  
Word: 'APOLLO', Bounding Polygon: ((202, 1766), (275, 1766), (274, 1791), (202, 1792)), Confidence: 0.9930  
Word: 'CONTROL:', Bounding Polygon: ((285, 1767), (384, 1768), (382, 1791), (284, 1791)), Confidence: 0.9930  
Word: 'The', Bounding Polygon: ((389, 1768), (423, 1768), (421, 1791), (387, 1791)), Confidence: 0.9930  
Word: 'next', Bounding Polygon: ((429, 1768), (472, 1768), (470, 1791), (428, 1791)), Confidence: 0.9920  
Word: 'major', Bounding Polygon: ((477, 1768), (533, 1769), (531, 1791), (475, 1791)), Confidence: 0.9960  
Word: 'stay-no', Bounding Polygon: ((540, 1769), (606, 1769), (603, 1791), (537, 1791)), Confidence: 0.9930  
Word: 'stay', Bounding Polygon: ((614, 1769), (653, 1769), (650, 1791), (611, 1791)), Confidence: 0.9880  
Bounding Polygon: ((162, 1786), (650, 1791), (650, 1815), (162, 1811))  
Word: 'will', Bounding Polygon: ((165, 1787), (200, 1787), (200, 1812), (165, 1812)), Confidence: 0.9900  
Word: 'be', Bounding Polygon: ((204, 1787), (226, 1787), (226, 1811), (204, 1812)), Confidence: 0.9950  
Word: 'for', Bounding Polygon: ((231, 1787), (260, 1787), (260, 1811), (231, 1811)), Confidence: 0.8700  
Word: 'the', Bounding Polygon: ((264, 1787), (294, 1788), (294, 1810), (264, 1811)), Confidence: 0.9930  
Word: 'T2', Bounding Polygon: ((301, 1788), (324, 1788), (324, 1810), (301, 1810)), Confidence: 0.9090  
Word: 'event.', Bounding Polygon: ((329, 1788), (386, 1789), (386, 1810), (329, 1810)), Confidence: 0.8220  
Word: 'That', Bounding Polygon: ((390, 1789), (429, 1790), (429, 1810), (390, 1810)), Confidence: 0.9890  
Word: 'is', Bounding Polygon: ((433, 1790), (452, 1790), (452, 1810), (433, 1810)), Confidence: 0.9970  
Word: 'at', Bounding Polygon: ((456, 1790), (479, 1790), (479, 1811), (456, 1810)), Confidence: 0.9890  
Word: '21', Bounding Polygon: ((483, 1790), (505, 1791), (505, 1811), (483, 1811)), Confidence: 0.9970  
Word: 'minutes', Bounding Polygon: ((509, 1791), (582, 1792), (582, 1813), (509, 1811)), Confidence: 0.9940  
Word: '26', Bounding Polygon: ((587, 1792), (608, 1793), (608, 1813), (587, 1813)), Confidence: 0.9900  
Word: 'sec-', Bounding Polygon: ((615, 1793), (650, 1794), (650, 1815), (615, 1814)), Confidence: 0.9580  
Bounding Polygon: ((1756, 1766), (2294, 1754), (2295, 1778), (1756, 1791))  
Word: 'a', Bounding Polygon: ((1761, 1767), (1773, 1767), (1773, 1791), (1761, 1792)), Confidence: 0.9940  
Word: 'television', Bounding Polygon: ((1780, 1766), (1865, 1764), (1864, 1789), (1780, 1791)), Confidence: 0.9850  
Word: 'camera', Bounding Polygon: ((1873, 1764), (1939, 1762), (1938, 1787), (1873, 1788)), Confidence: 0.9940  
Word: 'outside', Bounding Polygon: ((1944, 1762), (2010, 1761), (2009, 1785), (1943, 1786)), Confidence: 0.9940  
Word: 'the', Bounding Polygon: ((2015, 1760), (2046, 1760), (2045, 1784), (2014, 1785)), Confidence: 0.9980  
Word: 'craft', Bounding Polygon: ((2051, 1760), (2097, 1759), (2096, 1783), (2050, 1784)), Confidence: 0.9940  
Word: 'transmitted', Bounding Polygon: ((2101, 1759), (2203, 1757), (2202, 1780), (2100, 1782)), Confidence: 0.9900  
Word: 'his', Bounding Polygon: ((2208, 1756), (2238, 1756), (2237, 1779), (2207, 1780)), Confidence: 0.9980  
Word: 'every', Bounding Polygon: ((2243, 1756), (2291, 1755), (2290, 1778), (2242, 1779)), Confidence: 0.9910  
Bounding Polygon: ((164, 1804), (508, 1813), (508, 1834), (164, 1825))  
Word: 'inde', Bounding Polygon: ((165, 1804), (210, 1806), (210, 1827), (165, 1826)), Confidence: 0.0080  
Word: '.Phan', Bounding Polygon: ((214, 1806), (256, 1807), (256, 1828), (214, 1827)), Confidence: 0.0070  
Word: 'Esifiction', Bounding Polygon: ((260, 1807), (342, 1810), (342, 1830), (260, 1828)), Confidence: 0.4190  
Word: 'of', Bounding Polygon: ((350, 1810), (369, 1811), (369, 1831), (350, 1830)), Confidence: 0.9630  
Word: 'power', Bounding Polygon: ((377, 1811), (431, 1812), (431, 1832), (377, 1831)), Confidence: 0.2170  
Word: 'descent.', Bounding Polygon: ((436, 1812), (509, 1814), (509, 1834), (436, 1832)), Confidence: 0.9880  
Bounding Polygon: ((1758, 1790), (2298, 1776), (2299, 1800), (1758, 1813))  
Word: 'moved', Bounding Polygon: ((1762, 1791), (1821, 1789), (1820, 1812), (1760, 1813)), Confidence: 0.9940  
Word: 'to', Bounding Polygon: ((1831, 1789), (1850, 1788), (1849, 1811), (1830, 1812)), Confidence: 0.9980  
Word: 'an', Bounding Polygon: ((1860, 1788), (1883, 1787), (1882, 1811), (1859, 1811)), Confidence: 0.9970  
Word: 'awed', Bounding Polygon: ((1892, 1787), (1940, 1786), (1939, 1810), (1892, 1811)), Confidence: 0.9930  
Word: 'and', Bounding Polygon: ((1949, 1786), (1983, 1785), (1982, 1809), (1949, 1809)), Confidence: 0.9930  
Word: 'excited', Bounding Polygon: ((1991, 1784), (2055, 1783), (2055, 1807), (1990, 1809)), Confidence: 0.9940  
Word: 'audience', Bounding Polygon: ((2065, 1783), (2143, 1781), (2143, 1805), (2065, 1807)), Confidence: 0.9930  
Word: 'of', Bounding Polygon: ((2152, 1780), (2175, 1780), (2176, 1804), (2153, 1804)), Confidence: 0.9960

Word: 'hundreds', Bounding Polygon: ((2180, 1780), (2264, 1778), (2265, 1801), (2181, 1804)), Confidence: 0.9940  
 Word: 'of', Bounding Polygon: ((2271, 1777), (2293, 1777), (2295, 1800), (2272, 1801)), Confidence: 0.9980  
 Bounding Polygon: ((1757, 1813), (2013, 1810), (2013, 1831), (1757, 1836))  
 Word: 'millions', Bounding Polygon: ((1762, 1814), (1835, 1812), (1834, 1835), (1760, 1837)), Confidence: 0.9910  
 Word: 'of', Bounding Polygon: ((1839, 1812), (1860, 1812), (1859, 1834), (1838, 1835)), Confidence: 0.9980  
 Word: 'people', Bounding Polygon: ((1864, 1812), (1922, 1811), (1922, 1833), (1863, 1834)), Confidence: 0.9950  
 Word: 'on', Bounding Polygon: ((1927, 1811), (1948, 1811), (1948, 1833), (1926, 1833)), Confidence: 0.9990  
 Word: 'earth.', Bounding Polygon: ((1955, 1811), (2010, 1810), (2010, 1832), (1954, 1832)), Confidence: 0.9940  
 Bounding Polygon: ((968, 1837), (1749, 1839), (1749, 1868), (968, 1863))  
 Word: 'how', Bounding Polygon: ((970, 1837), (1008, 1837), (1007, 1858), (968, 1856)), Confidence: 0.0030  
 Word: 'the', Bounding Polygon: ((1017, 1838), (1046, 1838), (1044, 1859), (1016, 1858)), Confidence: 0.1150  
 Word: 'fan', Bounding Polygon: ((1051, 1838), (1082, 1838), (1080, 1860), (1049, 1859)), Confidence: 0.3990  
 Word: 'of', Bounding Polygon: ((1087, 1838), (1106, 1838), (1104, 1861), (1086, 1860)), Confidence: 0.8910  
 Word: 'the', Bounding Polygon: ((1111, 1838), (1139, 1838), (1137, 1862), (1109, 1861)), Confidence: 0.9780  
 Word: 'landing', Bounding Polygon: ((1144, 1838), (1215, 1839), (1213, 1864), (1142, 1862)), Confidence: 0.7040  
 Word: 'craft', Bounding Polygon: ((1221, 1839), (1262, 1839), (1261, 1865), (1219, 1864)), Confidence: 0.8450  
 Word: 'after', Bounding Polygon: ((1267, 1839), (1312, 1839), (1311, 1866), (1266, 1865)), Confidence: 0.9890  
 Word: 'taking', Bounding Polygon: ((1317, 1839), (1372, 1839), (1370, 1866), (1316, 1866)), Confidence: 0.9890  
 Word: 'the', Bounding Polygon: ((1377, 1839), (1405, 1839), (1404, 1867), (1375, 1866)), Confidence: 0.9940  
 Word: 'first', Bounding Polygon: ((1410, 1839), (1452, 1839), (1450, 1867), (1409, 1867)), Confidence: 0.9890  
 Word: 'step', Bounding Polygon: ((1457, 1839), (1495, 1839), (1494, 1867), (1455, 1867)), Confidence: 0.9850  
 Word: 'on', Bounding Polygon: ((1500, 1839), (1522, 1840), (1520, 1868), (1499, 1867)), Confidence: 0.9960  
 Word: 'the', Bounding Polygon: ((1527, 1840), (1558, 1840), (1557, 1867), (1525, 1868)), Confidence: 0.9940  
 Word: 'surface', Bounding Polygon: ((1563, 1840), (1628, 1840), (1627, 1867), (1562, 1867)), Confidence: 0.9920  
 Word: 'of', Bounding Polygon: ((1633, 1840), (1652, 1840), (1650, 1867), (1632, 1867)), Confidence: 0.9960  
 Word: 'the', Bounding Polygon: ((1657, 1840), (1691, 1840), (1689, 1867), (1655, 1867)), Confidence: 0.9940  
 Word: 'moon', Bounding Polygon: ((1697, 1840), (1744, 1840), (1743, 1866), (1695, 1867)), Confidence: 0.8860  
 Bounding Polygon: ((1894, 1836), (2168, 1830), (2169, 1855), (1894, 1862))  
 Word: 'Tentative', Bounding Polygon: ((1898, 1837), (1992, 1834), (1994, 1860), (1899, 1863)), Confidence: 0.9920  
 Word: 'Steps', Bounding Polygon: ((2003, 1833), (2058, 1832), (2060, 1858), (2004, 1860)), Confidence: 0.9890  
 Word: 'Test', Bounding Polygon: ((2070, 1832), (2116, 1831), (2117, 1856), (2072, 1858)), Confidence: 0.9900  
 Word: 'Soil', Bounding Polygon: ((2124, 1831), (2167, 1831), (2168, 1855), (2126, 1856)), Confidence: 0.9900

Results saved in text.jpg

#### Recognized Paragraph:

The New York Times LATE CITY EDITION "All the News Weather: Rain, warm today; clear That's Fit to Print" tonight. Sunny, pleasant tomorrow. Temp. range: today 80-66; Sunday 71-66. Temp .- Hum. Index yesterday 69. Complete U.S. report on P. 50. VOL.CXVIII.No.40,721 1969 The New York Times Company. NEW YORK, MONDAY, JULY 21,1969 x 10 CENTS MEN WALK ON MOON ASTRONAUTS LAND ON PLAIN; COLLECT ROCKS, PLANT FLAG Voice From Moon: A Powdery Surface 'Eagle Has Landed' Is Closely Explored EAGLE (the lunar module): Houston, Tranquility Base here. The Eagle has landed. By JOHN NOBLE WILFORD New York Times Special to The New York Times HOUSTON: Roger, Tranquility, we copy you on the HOUSTON, Monday, July 21-Men have landed and ground. You've got a bunch of guys about to turn blue. walked on the moon. We're breathing again. Thanks a lot. Two Americans, astronauts of Apollo 11, steered their TRANQUILITY BASE: Thank you. fragile four-legged lunar module safely and smoothly to HOUSTON: You're looking good here. the historic landing yesterday at 4:17:40 P.M., Eastern day- TRANQUILITY BASE: A very smooth touchdown. light time. HOUSTON: Eagle, you are stay for T1. [The first Neil A. Armstrong, the 38-year-old civilian commander, step in the lunar operation.] Over. radioed to earth and the mission control room here: TRANQUILITY BASE: Roger. Stay for TI. "Houston, Tranquility Base here. The Eagle has landed." HOUSTON: Roger and we see you venting the ox. The first men to reach the moon-Mr. Armstrong and TRANQUILITY BASE: Roger. his co-pilot, Col. Edwin E. Aldrin Jr. of the Air Force- COLUMBIA (the command and service module): brought their ship to rest on a level, rock-strewn plain near How do you read me? the southwestern shore of the arid Sea of Tranquility. HOUSTON: Columbia, he has landed Tranquility About six and a half hours later, Mr. Armstrong opened Base, Eagle is at Tranquility. I read you five by. the landing craft's hatch, stepped slowly down the ladder Over. and. declared as he planted the first human footprint on COLUMBIA: Yes, I heard the whole thing. the lunar crust: HOUSTON: Well, it's a good show. "That's one small step for man, one giant leap for COLUMBIA: Fantastic. mankind." TRANQUILITY BASE: I'll second that. His first step on the moon came at- 10:56:20 P.M., as APOLLO CONTROL: The next major stay-no stay will be for the T2 event. That is at 21 minutes 26 sec- a television camera outside the craft transmitted his every move to an awed and excited audience of hundreds of millions of people on earth. how the fan of the landing craft after taking the first step on the surface of the moon Tentative Steps Test Soil

**"All the News  
That's Fit to Print"**

# The New York Times

LATE CITY EDITION  
Weather: Rain, warm today; clear tonight. Sunny, pleasant tomorrow.  
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VOL. CXVIII. No. 40,721 © 1969 The New York Times Company NEW YORK MONDAY, JULY 21, 1969 X 10 CENTS

# MEN WALK ON MOON

## ASTRONAUTS LAND ON PLAIN; COLLECT ROCKS, PLANT FLAG

**Voice From Moon:  
'Eagle Has Landed'**

EAGLE (the lunar module): Houston, Tranquility Base here. The Eagle has landed.

HOUSTON: Roger, Tranquility, we copy you or the ground. You've got a bunch of guys about to turn blue. We're breathing again. Thanks a lot.

TRANQUILITY BASE: Thank you.

HOUSTON: You're looking good here.

TRANQUILITY BASE: A very smooth touchdown.

HOUSTON: Eagle, you are stay for TI. [The first step in the lunar operation.] Over.

TRANQUILITY BASE: Roger. Stay for TI.

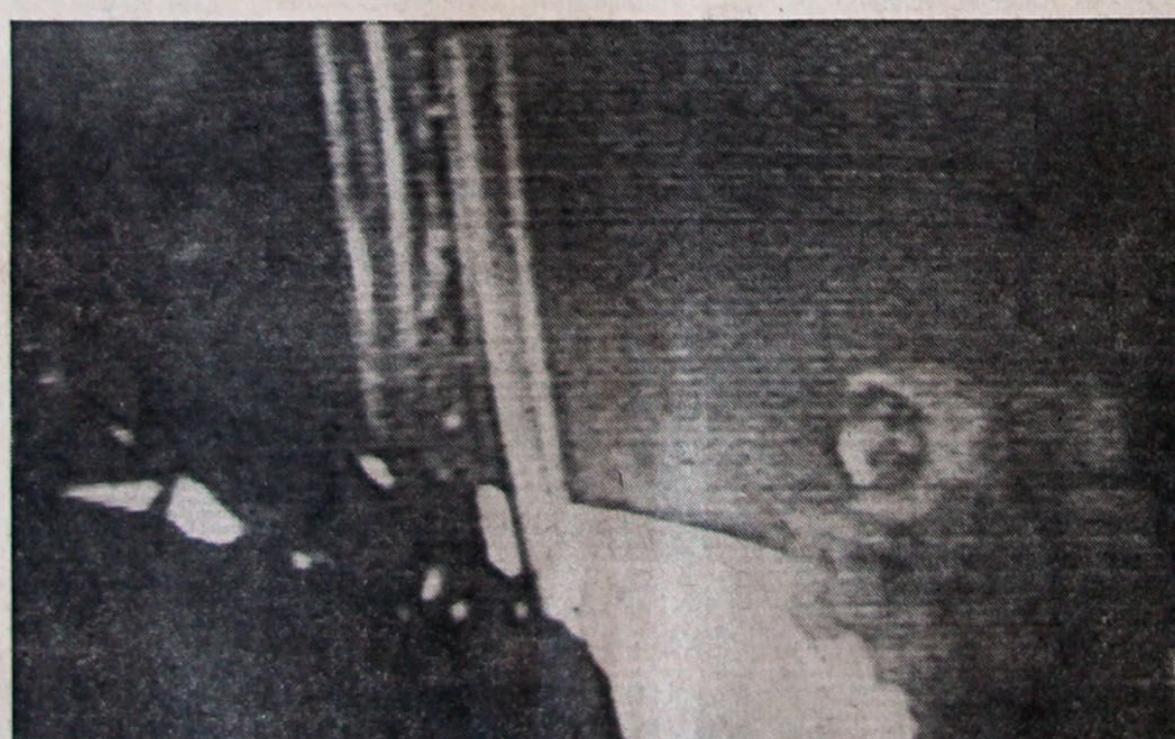
HOUSTON: Roger and we see you venting the ox.

TRANQUILITY BASE: Roger.

COLUMBIA (the command and service module): How do you read me?

HOUSTON: Columbia, he has landed Tranquility Base. Eagle is at Tranquility. I read you five by. Over.

COLUMBIA: Yes, I heard the whole thing.



**A Powdery Surface  
Is Closely Explored**

By JOHN NORBLE WILFORD  
Special to The New York Times

HOUSTON, Monday, July 21—Men have landed and walked on the moon.

Two Americans, astronauts of Apollo 11, steered their fragile four-legged lunar module safely and smoothly to the historic landing yesterday at 4:17:40 P.M., Eastern daylight time.

Neil A. Armstrong, the 38-year-old civilian commander, radioed to earth and the mission control room here: "Houston, Tranquility Base here. The Eagle has landed."

The first men to reach the moon—Mr. Armstrong and his co-pilot, Col. Edwin E. Aldrin Jr. of the Air Force—brought their ship to rest on a level, rock-strewn plain near the southwestern shore of the arid Sea of Tranquility.

About six and a half hours later, Mr. Armstrong opened the landing craft's hatch, stepped slowly down the ladder and declared as he planted the first human footprint on the lunar crust:



```
In [4]: print(text)
```

The New York Times LATE CITY EDITION "All the News Weather: Rain, warm today; clear That's Fit to Print" tonight. Sunny, pleasant tomorrow. Temp. range: today 80-66; Sunday 71-66. Temp .- Hum. Index yesterday 69. Complete U.S. report on P. 50. VOL.CXVIII.No.40,721 1969 The New York Times Company. NEW YORK, MONDAY, JULY 21,1969 x 10 CENTS MEN WALK ON MOON ASTRONAUTS LAND ON PLAIN; COLLECT ROCKS, PLANT FLAG Voice From Moon: A Powdery Surface 'Eagle Has Landed' Is Closely Explored EAGLE (the lunar module): Houston, Tranquility Base here. The Eagle has landed. By JOHN NOBLE WILFORD New York Times Special to The New York Times HOUSTON: Roger, Tranquility, we copy you on the HOUSTON, Monday, July 21-Men have landed and ground. You've got a bunch of guys about to turn blue. walked on the mo on. We're breathing again. Thanks a lot. Two Americans, astronauts of Apollo 11, steered their TRANQUILITY BASE: Thank you. fragile four-legged lunar module safely and smoothly to HOUSTON: You're lo oking good here. the historic landing yesterday at 4:17:40 P.M., Eastern day- TRANQUILITY BASE: A very smooth touchdown. light time. HOUSTON: Eagle, you are stay for T1. [The first Neil A. Armstrong, the 38-year-old civilian commander, step in the lunar operation.] Over. radioed to earth and the mission control room here: TRANQUILITY BASE: Roger. Stay for TI. "Houston, Tranquility Base here. The Eagle has landed." HOUSTON: Roger and we see you venting the ox. The first men to reach the moon-Mr. Armstrong and TRANQUILITY BASE: Roger. his co-pilot, Col. Edwin E. Aldrin Jr. of the Air Force- COLUMBIA (the command and service module): brought their ship to rest on a level, rock-strewn plain near How do you read me? the southwestern shore of the arid Sea of Tranquility. HOUSTON: Colum ia, he has landed Tranquility About six and a half hours later, Mr. Armstrong opened Base, Eagle is at Tranquility. I read you five by. the landing craft's hatch, stepped slowly down the ladder Over. and. declared as he planted the first human footprint on COLUMBIA: Yes, I heard the whole thing. the lunar crust: HOUSTON: Well, it's a good show. "That's one small step for man, one giant leap for COLUMBIA: Fantastic. mankind." TRANQUILITY BASE: I'll second that. His first step on the moon came at- 10:56:20 P.M., as APOLLO CONTROL: The next major stay-no stay will be for the T2 event. That is at 21 minutes 26 sec- a television camera outside the craft transmitted his every inde .Phan Esification of power descent. moved to an awed and excited audience of hundreds of millions of people o n earth. how the fan of the landing craft after taking the first step on the surface of the moon Tentative Steps Test Soil

### 3. Translation Function

After extracting the text, the next step is to translate it into a desired language. This function:

- Loads the environment variables related to the Azure Translator service.
- Authenticates and initializes the Azure Translator client.
- Asks the user for a target language code (e.g., 'en' for English).
- Sends the extracted text to Azure Translator for translation.
- Returns the translated text in the specified language.

This component allows seamless translation of content, making it accessible to users in different languages.

```
In [5]: translate_env_file = '06b-translator-sdk/Python/translate-text/.env'
def translate(input_text):
    try:
        # Get Configuration Settings
        load_dotenv(translate_env_file)
        translatorRegion = os.getenv('TRANSLATOR_REGION')
        translatorKey = os.getenv('TRANSLATOR_KEY')

        # Create client using endpoint and key
        credential = TranslatorCredential(translatorKey, translatorRegion)
        client = TextTranslationClient(credential)

        # Choose target language
        languagesResponse = client.get_languages(scope="translation")
```

```
print("{} languages supported.".format(len(languagesResponse.translation)))
print("(See https://learn.microsoft.com/azure/ai-services/translator/language-support#translation)")
print("Enter a target language code for translation (for example, 'en'):")
targetLanguage = "xx"
supportedLanguage = False
while supportedLanguage == False:
    targetLanguage = input()
    if targetLanguage in languagesResponse.translation.keys():
        supportedLanguage = True
    else:
        print("{} is not a supported language.".format(targetLanguage))

# Translate text
inputText = input_text
input_text_elements = [InputTextItem(text=inputText)]
translationResponse = client.translate(content=input_text_elements, to=[targetLanguage])
translation = translationResponse[0] if translationResponse else None
if translation:
    sourceLanguage = translation.detected_language
    for translated_text in translation.translations:
        print(f"'{inputText}' was translated from {sourceLanguage.language} to {translated_text.to} as '{translated_text.text}'.")

except Exception as ex:
    print(ex)

return translation.translations[0].text
```

In [6]: `translation = translate(text)`

135 languages supported.

(See <https://learn.microsoft.com/azure/ai-services/translator/language-support#translation>)

Enter a target language code for translation (for example, 'en'):

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Von JOHN NOBLE WILFORD New York Times Special für die New York Times HOUSTON: Roger, Tranquility, wir kopieren Sie auf der HOUSTON, Montag, 21. Juli - Männer sind gelandet und gelandet. Du hast einen Haufen Jungs, die kurz davor sind, blau zu werden. auf dem Mond spazieren ging. Wir atmen wieder. Vielen Dank. Zwei Amerikaner, Astronauten von Apollo 11, steuerten ihre TRANQUILITY BASE: Danke. Zerbrechliche vierbeinige Mondlandefähre sicher und reibungslos nach HOUSTON: Hier siehst du gut aus. die historische Landung gestern um 16:17:40 Uhr, Eastern Day - TRANQUILITY BASE: Eine sehr sanfte Landung. Lichtzeit. HOUSTON: Eagle, du bleibst für T1. [Der erste Neil A. Armstrong, der 38-jährige zivile Kommandeur, tritt in die Mondoperation ein.] Über. Gefunkt zur Erde und zum Missionskontrollraum hier: TRANQUILITY BASE: Roger. Bleiben Sie für T1. "Houston, Tranquility Base hier. Der Adler ist gelandet." HOUSTON: Roger und wir sehen, wie Sie den Ochsen ablassen. Die ersten Menschen, die den Mond erreichten - Mr. Armstrong und TRANQUILITY BASE: Roger. sein Co-Pilot, Col. Edwin E. Aldrin Jr. von der Air Force - COLUMBIA (dem Kommando- und Servicemodul): brachte ihr Schiff auf einer Ebene, mit Felsen übersäten Ebene in der Nähe von How do you read me? die südwestliche Küste des trockenen Meeres der Ruhe. HOUSTON: Columbia, er hat Tranquility gelandet Etwa sechseinhalb Stunden später eröffnete Mr. Armstrong die Base, Eagle ist bei Tranquility. Ich habe dich zu fünf gelesen. Die Luke des Landungsbootes stieg langsam die Leiter hinab. und. erklärte, als er den ersten menschlichen Fußabdruck auf der COLUMBIA hinterließ: Ja, ich habe das Ganze gehört. die Mondkruste: HOUSTON: Nun, es ist eine gute Show. "Das ist ein kleiner Schritt für den Menschen, ein riesiger Sprung für COLUMBIA: Fantastisch. Menschheit." TRANQUILITY BASE: Dem schließe ich mich an. Sein erster Schritt auf dem Mond erfolgte um 22:56:20 Uhr, als APOLLO CONTROL: Der nächste große Aufenthalt ohne Aufenthalt wird für das T2-Event sein. Das ist bei 21 Minuten 26 Sekunden - eine Fernsehkamera außerhalb des Raumschiffs übertrug jede seiner Inde. Phan Esifikation des Machtabstiegs. vor einem ehrfürchtigen und begeisterten Publikum von Hunderten von Millionen Menschen auf der Erde. wie der Fächer des Landefahrzeugs nach dem ersten Schritt auf der Mondoberfläche Tentative Steps Test Soil'.

```
In [7]: print(translation)
```

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## 4. Azure OpenAI Function (ChatGPT-4)

This function uses Azure OpenAI to generate content (like an article) based on a provided prompt. The function performs the following:

- Loads environment variables for the Azure OpenAI service.
- Reads a system message (which sets the context for the AI's behavior) from a file.
- Initializes an asynchronous Azure OpenAI client.
- Sends a prompt to the OpenAI model, using both the system message and user input to guide the AI in generating text.

This part of the pipeline handles natural language generation, enabling creative or informative text to be produced based on the extracted and translated content.

## Helper Function for OpenAI Chat

This helper function assists in sending conversation-style prompts to the OpenAI model. It formats the interaction as a series of messages:

- The **system message** provides context or instructions on how the model should respond.
- The **user message** is the input provided by the user, guiding the model to generate relevant content.

The function interacts with the OpenAI API, retrieves the AI-generated response, and returns it to the main process. This structured communication ensures the AI provides coherent and useful responses.

### \*Article Writer: Rephrases the text of the article ensuring professional writing and formatting\*

```
In [8]: printFullResponse = False
chat_env_file = '03-prompt-engineering/Python/.env'
system_file = '03-prompt-engineering/Python/system.txt'
async def prompt(prompt_text):
    try:
        # Get configuration settings
        load_dotenv(chat_env_file)
        azure_oai_endpoint = os.getenv("AZURE_OAI_ENDPOINT")
        azure_oai_key = os.getenv("AZURE_OAI_KEY")
        azure_oai_deployment = os.getenv("AZURE_OAI_DEPLOYMENT")

        # Configure the Azure OpenAI client
        client = AsyncAzureOpenAI(
            azure_endpoint=azure_oai_endpoint,
            api_key=azure_oai_key,
            api_version="2024-02-15-preview"
        )

        # Load system prompt once (no need to ask each time)
        system_text = open(file=system_file, encoding="utf8").read().strip()

        # Prompt for user message
        user_text = prompt_text

        # Call OpenAI model with system and user messages
        response = await call_openai_model(
            system_message=system_text,
            user_message=user_text,
            model=azure_oai_deployment,
            client=client
        )
    
```

```

    return response

except Exception as ex:
    print(ex)

async def call_openai_model(system_message, user_message, model, client):

    # Create the message format for the chat model
    messages = [
        {"role": "system", "content": system_message},
        {"role": "user", "content": user_message},
    ]

    print("\nSending request to Azure OpenAI model...\n")

    # Call the Azure OpenAI model
    response = await client.chat.completions.create(
        model=model,
        messages=messages,
        temperature=0.7,
        max_tokens=800
    )

    # Optionally print the full response
    if printFullResponse:
        print(response)

    # Display the model's response
    print("Response:\n" + response.choices[0].message.content + "\n")

    return response.choices[0].message.content

```

In [9]: article = await prompt(translation)

Sending request to Azure OpenAI model...

Response:

Kategorie: Weltraum und Astronomie

Titel: Menschlicher Fußabdruck auf dem Mond: Eine historische Leistung der Apollo 11 Astronauten

Artikel:

Am 21. Juli 1969 wurde Geschichte geschrieben, als zwei amerikanische Astronauten der Apollo 11 Mission zum ersten Mal auf dem Mond landeten. Neil A. Armstrong und Col. Edwin E. Aldrin Jr. steuerten ihre Mondlandefähre sicher auf einer felsigen Ebene nahe der südwestlichen Küste des trockenen Meeres der Ruhe.

Armstrong, der zivile Kommandeur der Mission, war der erste Mensch, der seinen Fuß auf die Mondkruste setzte. "Houston, Tranquility Base hier. Der Adler ist gelandet", funkte er zur Erde und zum Missionskontrollraum in Houston. Dieser historische Moment wurde um 16:17:40 Uhr Eastern Daylight Time festgehalten.

Etwa sechseinhalb Stunden später verließ Armstrong das Landefahrzeug und betrat als erster Mensch den Mond. "Das ist ein kleiner Schritt für den Menschen, ein riesiger Sprung für die Menschheit", verkündete er, während eine Fernsehkamera jedes seiner Worte und Bewegungen an ein gespanntes und begeistertes Publikum von Hunderten von Millionen Menschen auf der Erde übertrug.

Sein Co-Pilot, Col. Edwin E. Aldrin Jr., trat ihm auf dem Mond bei. Gemeinsam sammelten sie Proben und pflanzten die amerikanische Flagge auf der Mondoberfläche. Ihre erfolgreiche Landung und Rückkehr zur Erde markierten einen entscheidenden Moment in der menschlichen Geschichte und Raumfahrt.

**\*Article summarizer:** Extracts important words that describe the article for usage with Image Generation as image prompt\*

```
In [10]: printFullResponse = False
summarizer_system_file = '03-prompt-engineering/Python/system2.txt'
async def prompt(prompt_text):
    try:
        # Get configuration settings
        load_dotenv(chat_env_file)
        azure_oai_endpoint = os.getenv("AZURE_OAI_ENDPOINT")
        azure_oai_key = os.getenv("AZURE_OAI_KEY")
        azure_oai_deployment = os.getenv("AZURE_OAI_DEPLOYMENT")

        # Configure the Azure OpenAI client
        client = AsyncAzureOpenAI(
            azure_endpoint=azure_oai_endpoint,
            api_key=azure_oai_key,
            api_version="2024-02-15-preview"
        )

        # Load system prompt once (no need to ask each time)
        system_text = open(file=summarizer_system_file, encoding="utf8").read().strip()

        # Prompt for user message
        user_text = prompt_text

        # Call OpenAI model with system and user messages
        response = await call_openai_model(
            system_message=system_text,
            user_message=user_text,
            model=azure_oai_deployment,
            client=client
        )

        return response

    except Exception as ex:
        print(ex)

async def call_openai_model(system_message, user_message, model, client):

    # Create the message format for the chat model
    messages = [
        {"role": "system", "content": system_message},
        {"role": "user", "content": user_message},
    ]

    print("\nSending request to Azure OpenAI model...\n")

    # Call the Azure OpenAI model
    response = await client.chat.completions.create(
        model=model,
        messages=messages,
        temperature=0.7,
        max_tokens=800
    )
```

```
# Optionally print the full response
if printFullResponse:
    print(response)

# Display the model's response
print("Response:\n" + response.choices[0].message.content + "\n")

return response.choices[0].message.content
```

In [11]: `summary = await prompt(article)`

Sending request to Azure OpenAI model...

Response:  
"Astronauts on moon, planted American flag"

## 5. Image Generation Function

The image generation function uses the Azure OpenAI DALL-E model to generate images based on the AI-generated content. It:

- Loads the necessary environment variables for image generation.
- Prepares a request to the Azure OpenAI image generation API using a descriptive prompt.
- Sends the request and retrieves the generated image URL.

This feature transforms the generated text into a visually appealing representation, providing a complete end-to-end AI-driven content creation experience.

---

In [12]: `gen_env_file = '05-image-generation/Python/.env'`  
`def generate(image_prompt):`

```
# Get Azure OpenAI Service settings
load_dotenv(gen_env_file)
api_base = os.getenv("AZURE_OAI_ENDPOINT_GEN")
api_key = os.getenv("AZURE_OAI_KEY_GEN")
api_version = '2024-02-15-preview'

# Get prompt for image to be generated
prompt = image_prompt

# Call the DALL-E model
url = "{}openai/deployments/dall-e-3/images/generations?api-version={}".format(api_base, api_version)

headers = { "api-key": api_key, "Content-Type": "application/json" }
body = {
    "prompt": prompt,
    "n": 1,
    "size": "1792x1024"
}
response = requests.post(url, headers=headers, json=body)
print(response.json())
```

```
# Get the revised prompt and image URL from the response
revised_prompt = response.json()['data'][0]['revised_prompt']
image_url = response.json()['data'][0]['url']

# Display the URL for the generated image
print(revised_prompt)
print(image_url)

return image_url
```

In [13]: `image_url = generate(summary)`

```
{'created': 1728084494, 'data': [{'content_filter_results': {'hate': {'filtered': False, 'severity': 'safe'}, 'self_harm': {'filtered': False, 'severity': 'safe'}, 'sexual': {'filtered': False, 'severity': 'safe'}, 'violence': {'filtered': False, 'severity': 'safe'}}, 'prompt_filter_results': {'hate': {'filtered': False, 'severity': 'safe'}, 'profanity': {'detected': False, 'filtered': False}, 'self_harm': {'filtered': False, 'severity': 'safe'}, 'sexual': {'filtered': False, 'severity': 'safe'}, 'violence': {'filtered': False, 'severity': 'safe'}}, 'revised_prompt': 'Astronauts on the moon, having planted an American flag', 'url': 'https://dalleprodsec.blob.core.windows.net/private/images/e2cfa8ac-d66d-4e6a-9dff-e2432ce08ecc/generated_00.png?se=2024-10-05T23%3A28%3A29Z&sig=IP%2Be%2B03GcwnGkcQFDXpeg16n0ucQP%2F4tovU2AWL14Q4%3D&ske=2024-10-09T18%3A57%3A53Z&skoid=e52d5ed7-0657-4f62-bc12-7e5dbb260a96&sks=b&skt=2024-10-02T18%3A57%3A53Z&sktid=33e01921-4d64-4f8c-a055-5bdaffd5e33d&skv=2020-10-02&sp=r&spr=https&sr=b&sv=2020-10-02'}]}
```

Astronauts on the moon, having planted an American flag

```
https://dalleprodsec.blob.core.windows.net/private/images/e2cfa8ac-d66d-4e6a-9dff-e2432ce08ecc/generated\_00.png?se=2024-10-05T23%3A28%3A29Z&sig=IP%2Be%2B03GcwnGkcQFDXpeg16n0ucQP%2F4tovU2AWL14Q4%3D&ske=2024-10-09T18%3A57%3A53Z&skoid=e52d5ed7-0657-4f62-bc12-7e5dbb260a96&sks=b&skt=2024-10-02T18%3A57%3A53Z&sktid=33e01921-4d64-4f8c-a055-5bdaffd5e33d&skv=2020-10-02&sp=r&spr=https&sr=b&sv=2020-10-02
```

In [14]: `# Fetch the image from the URL  
response = requests.get(image_url)`

```
# Check if the request was successful
if response.status_code == 200:
    # Open the image using PIL
    image = Image.open(BytesIO(response.content))
    # Display the image
    plt.figure(figsize=(10, 10))
    plt.imshow(image)
    plt.title('Generated Image')
    plt.axis('off')
    plt.show()
else:
    print("Failed to retrieve the image.")
```

Generated Image



In [ ]: