Source code:

```
import easyocr
import re
from datetime import datetime
from pymongo import MongoClient

# MongoDB Configuration
MONGO_URI = "mongodb://localhost:27017"  # Replace with your MongoDB connection string
DB_NAME = "CampusEyeDB"
COLLECTION_NAME = "BusDetails"

def save_to_mongo(bus_number, plate_number, time):
    """Save the extracted data to MongoDB."""
    client = MongoClient(MONGO_URI)
    db = client[DB_NAME]
    collection = db[COLLECTION_NAME]
    data = {
        "bus_number": bus_number,
        "plate_number": plate_number,
        "time": time
    }
    result = collection.insert_one(data)
    print(f"Data saved to MongoDB with ID: {result.inserted_id}")

def detect_and_recognize(image_path):
    # Initialize EasyOCR Reader
    reader = easyocr.Reader(['en'])  # 'en' stands for English

    # Use EasyOCR to read text from the image
    results = reader.readtext(image_path)

    # Print all OCR results to inspect the output
    print("OCR Results:")
    #for result in results:
        #print(result[1])  # Print detected text

    # Initialize variables to hold the bus number and plate number
    bus_number = ""
    plate_number = ""

    # Process the OCR results
    for result in results:
        text = result[1].strip()

        # Check for a pattern that matches the bus number (typically 1 or 2 digits)
        if re.match(r'^\d{1,2}$', text):
            bus_number = text
```

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            # Check if the text matches the format of a vehicle license plate
            if re.match(r'[A-Z]{2}\d{1,2}\s*\d{4}', text):
                plate_number = text.strip()

        # If no license plate number is found, try to extract the first plausible match
        if not plate_number:
            potential_plate = []
            for result in results:
                text = result[1].strip()
                if re.match(r'[A-Z]{2}\d{1,2}', text):  # Match state and district (e.g., TN58)
                    potential_plate.append(text)
                elif re.match(r'[A-Z]{1}\d{4}', text):  # Match the 4-digit vehicle number (e.g., 7175)
                    potential_plate.append(text)

            if potential_plate:
                plate_number = " ".join(potential_plate)

        # Clean up the plate number by removing any extraneous characters
        if plate_number:
            plate_number = re.sub(r'[^A-Za-z0-9\s]', '', plate_number)

        # If no bus number is found from the OCR, fall back to extracting the first two digits from the
plate
        if not bus_number and plate_number:
            bus_number = plate_number.split()[1][:2] if len(plate_number.split()) > 1 else ""

        # Get the current time
        current_time = datetime.now().strftime("%Y-%m-%d %H:%M:%S")

        # Output the filtered result
        print(f"Bus Number: {bus_number}, Plate Number: {plate_number}, Time: {current_time}")

        # Save to MongoDB
        save_to_mongo(bus_number, plate_number, current_time)

    # Example usage with your bus image
    image_path = 'bus2.jpg'  # Replace with the actual path of the image
    detect_and_recognize(image_path)
```

requirments :

*python IDE

*MongoDB database

Libraries to install in terminal:

easyocr – command : pip install easyocr

pymongo – command : pip install pymongo

output:

```
Neither CUDA nor MPS are available - defaulting to CPU. Note: This module is much faster with a GPU.
OCR Results:
Bus Number: 17, Plate Number: TN45AM7436, Time: 2025-02-09 19:02:02
Data saved to MongoDB with ID: 67a8ae529ee94442d9dcb947

Process finished with exit code 0
```

The image I have used for ths project: