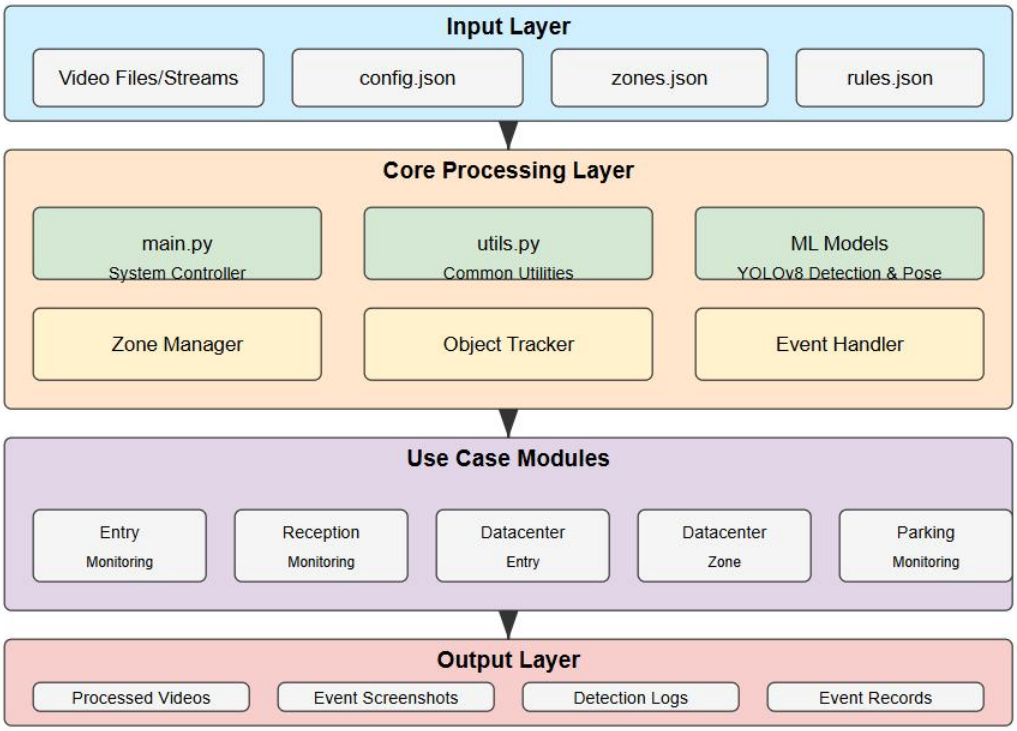
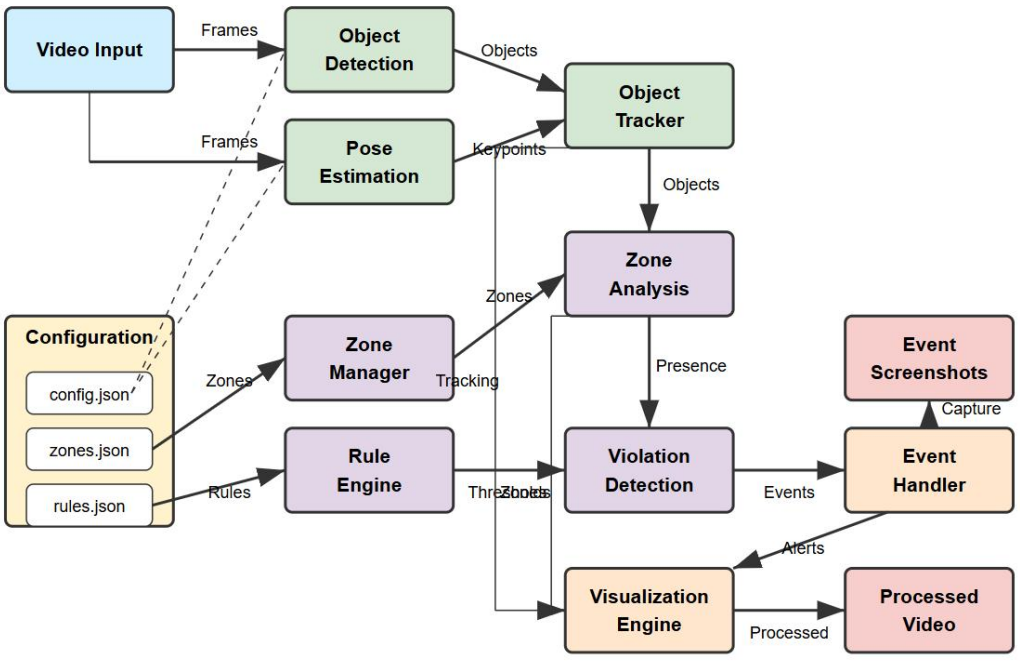
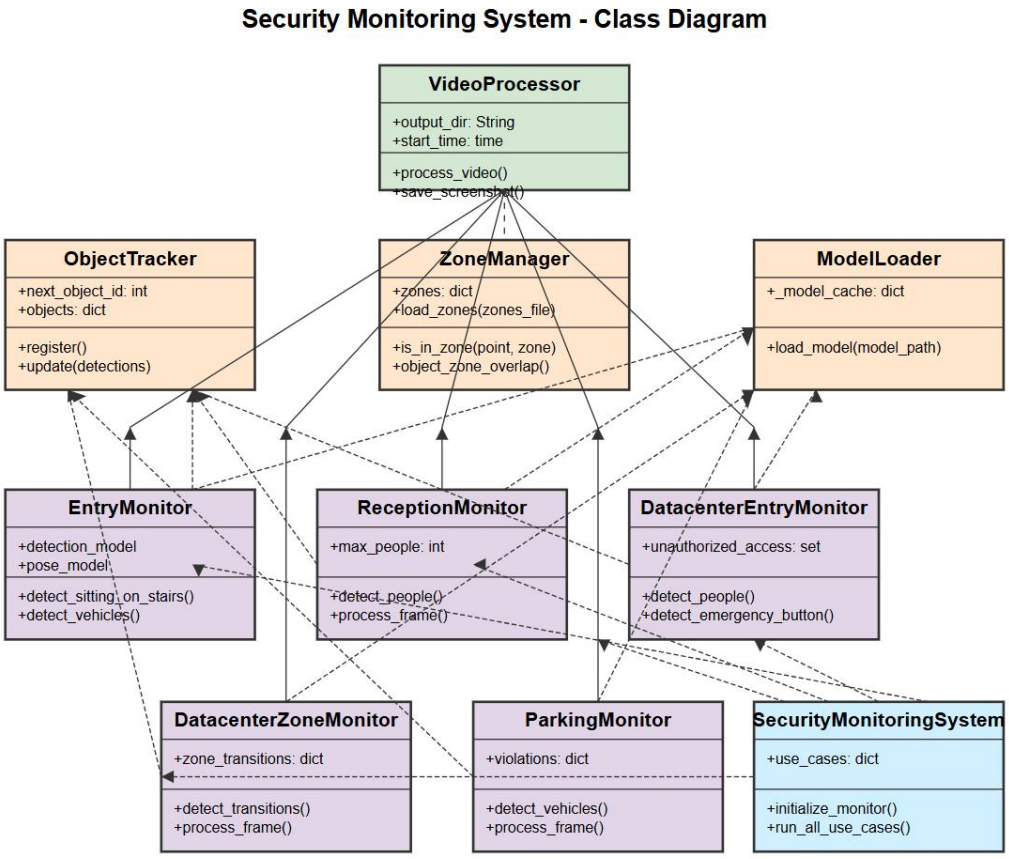
Security Monitoring System Architecture



Security Monitoring System - Data Flow





How to run the code :

Install dependencies

pip install -r requirements.txt

Running on a Single Video (Single Use Case)

Each use case module can run independently. For example, to run just the entry monitoring:

python3 entry_monitoring.py --input your_entry_video.mp4 --output results/entry_output.mp4

python3 reception_monitoring.py --input your_reception_video.mp4 --output results/reception_output.mp4

python3 datacenter_entry_monitoring.py --input your_datacenter_entry_video.mp4 --output results/datacenter_entry_output.mp4

python3 datacenter_zone_monitoring.py --input your_datacenter_inside_video.mp4 --output results/datacenter_zone_output.mp4

python3 parking_monitoring.py --input your_parking_video.mp4 --output results/parking_output.mp4

Running Multiple Videos on Multiple Cameras (All Use Cases)

To run all use cases with different videos for each camera:

```
python3 main.py --input1 entry_video.mp4 --input2 reception_video.mp4 --input3
datacenter_entry_video.mp4 --input4 datacenter_inside_video.mp4 --input5
parking_video.mp4 --output-dir results/
```

You can also run them in parallel for better performance:

```
python3 main.py --input1 entry_video.mp4 --input2 reception_video.mp4 --input3
datacenter_entry_video.mp4 --input4 datacenter_inside_video.mp4 --input5
parking_video.mp4 --output-dir results/ --parallel
```

Running Selected Use Cases

If you only want to run specific use cases:

```
# Run use cases 1 and 3 only
python3 main.py --input1 entry_video.mp4 --input3 datacenter_entry_video.mp4 --output-dir
results/

# Run just one specific use case
python3 main.py --use-case 2 --input2 reception_video.mp4 --output-dir results/
```

Additional Notes

1. **First Run**: On the first run, the system will automatically download the required YOLOv8 model files if they're not already present.
2. **Performance**: You can adjust the --skip-frames parameter (default is 2) to process every N frames for better performance:

```
python3 main.py --input1 entry_video.mp4 --skip-frames 3
```