Allpueli: Real-Time AI Emergency Detection System

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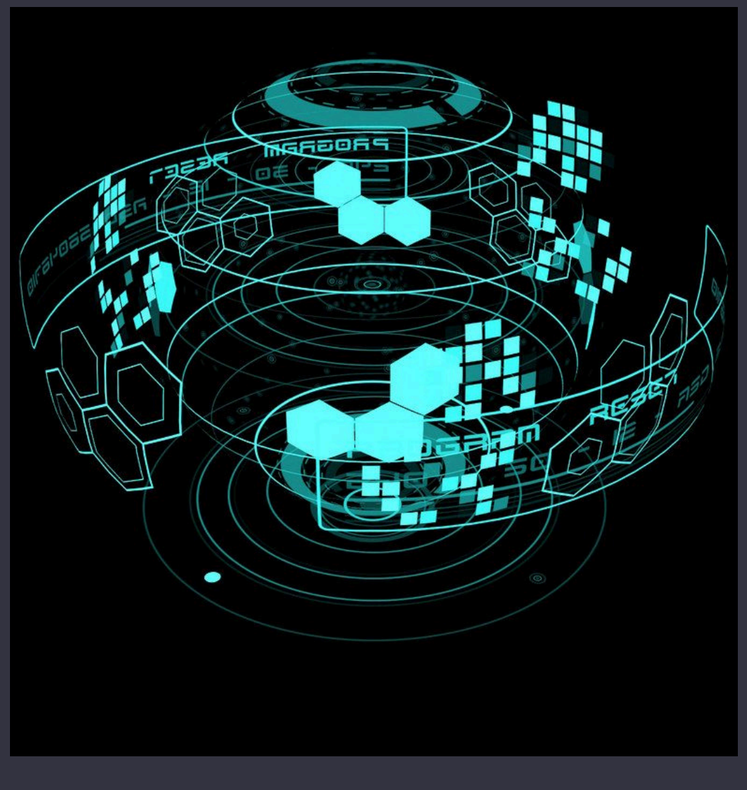
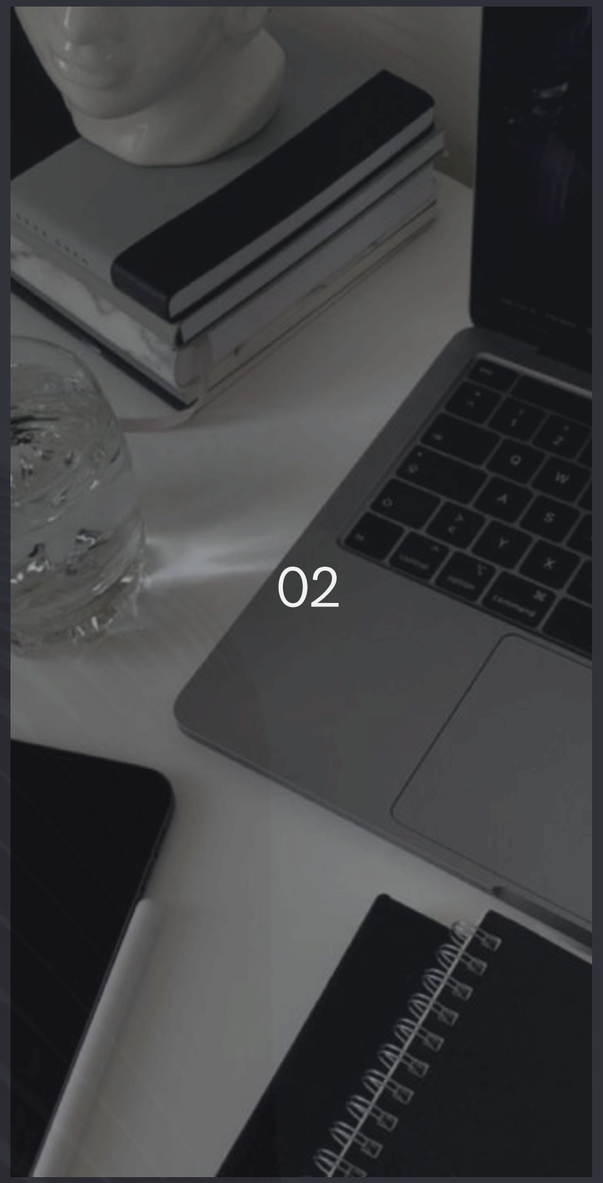


Our business proposal

- Monitors public transport dashcams to detect emergencies in real-time.

- Helps emergency services respond faster while protecting passenger privacy.



Who can use it?

CITY SERVICES

EMERGENCY SERVICES

DAILY USE

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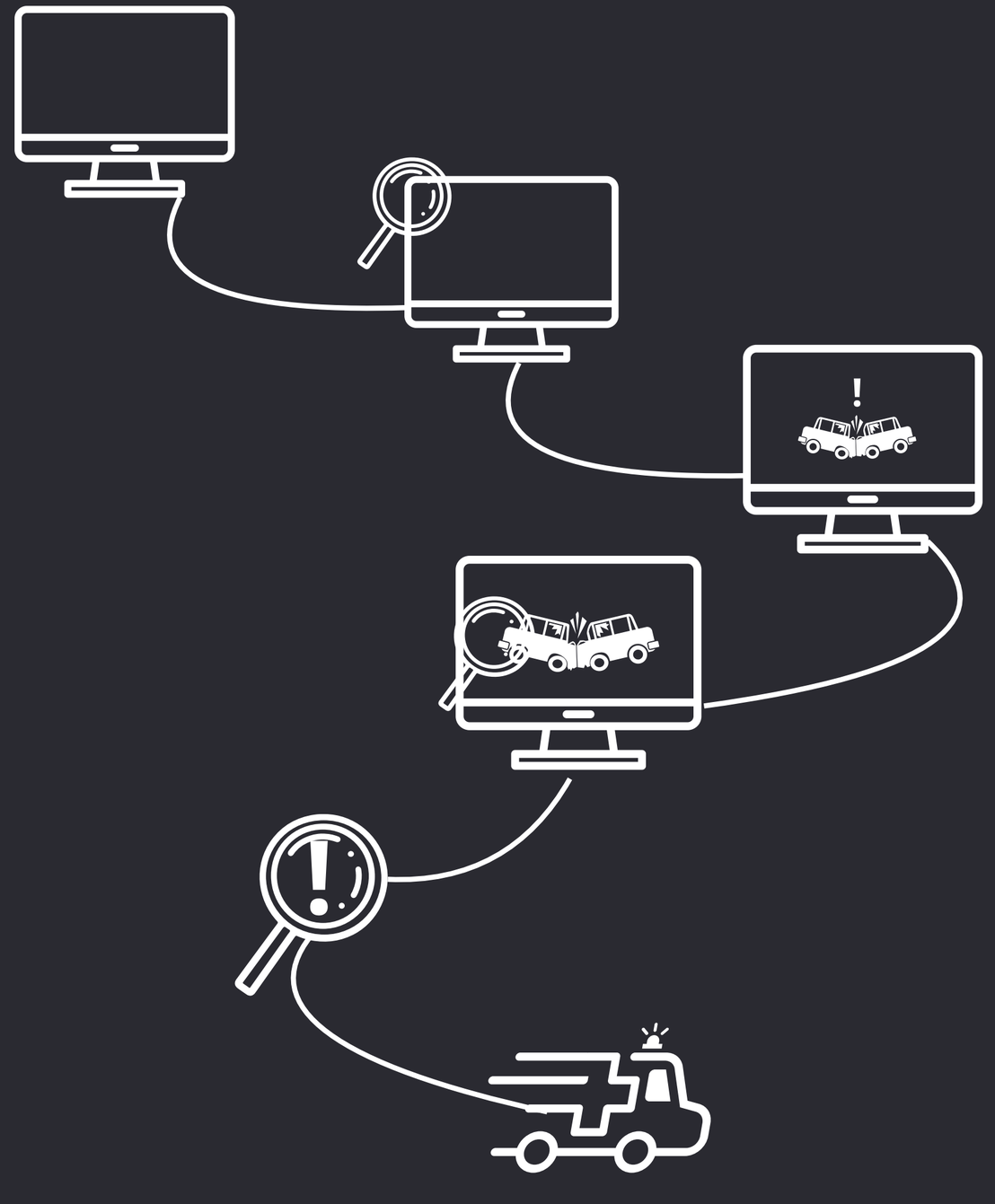
How does it work?



Why AI?

SPEED

- Allows fast analysis of great volumes of data

EFFICIENCY

- Delegates only the important actions to human operators

FUTURE IMPROVEMENT

- Can use historical data to update itself continuously

Challenges

Time to analyze the video (5-10 minutes for short segment) made iteration difficult

We didn’t manage to consistently detect vehicle lane for speed estimation

The video didn’t have enough metadata (such as geolocation, kinetics data)

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Risks & ethics

PRIVACY

- Possible identification of faces or other personal data.
- Risk of video stream leakage or misuse of access.

FAIRNESS

- Biased datasets may cause the algorithm to unfairly detect ‘dangerous events’ more frequently or miss some in different circumstances

FALSE POSITIVES

- False detection of a ‘dangerous’ situation may lead to unnecessary intervention or deployment of emergency services.

Mitigation

PRIVACY

- Use of automatic face blurring or other de-identification methods.
- Storing data only when an incident is confirmed, rather than continuously

FAIRNESS

- Implementing a ‘human-in-the-loop’ procedure: critical decisions are not made fully automatically.

FALSE POSITIVES

- Adjusting optimal detection thresholds.
- Using a multistage verification process (automatic model first and then a human operator).

```
base = os.path.basename(vid)
trimmed_path = f"trim_{base}"

fourcc = cv2.VideoWriter_fourcc(*'mp4v')
out = cv2.VideoWriter(trimmed_path, fourcc, fps, (w, h))

frame_count = 0
saved_frames = 0

while True:
    ret, frame = cap.read()
    if not ret:
        break

    if MAX_FRAMES != -1 and frame_count >= MAX_FRAMES:
        break

    # Save every Nth frame
    if frame_count % FRAME_SKIP == 0:
        out.write(frame)
        saved_frames += 1
```

Process & pipeline

Video analysis

- uses Python script with multiple models and CV methods to detect the “dangerous” events

Frontend

- Based on React TS

Backend

- Python FastAPI server

App

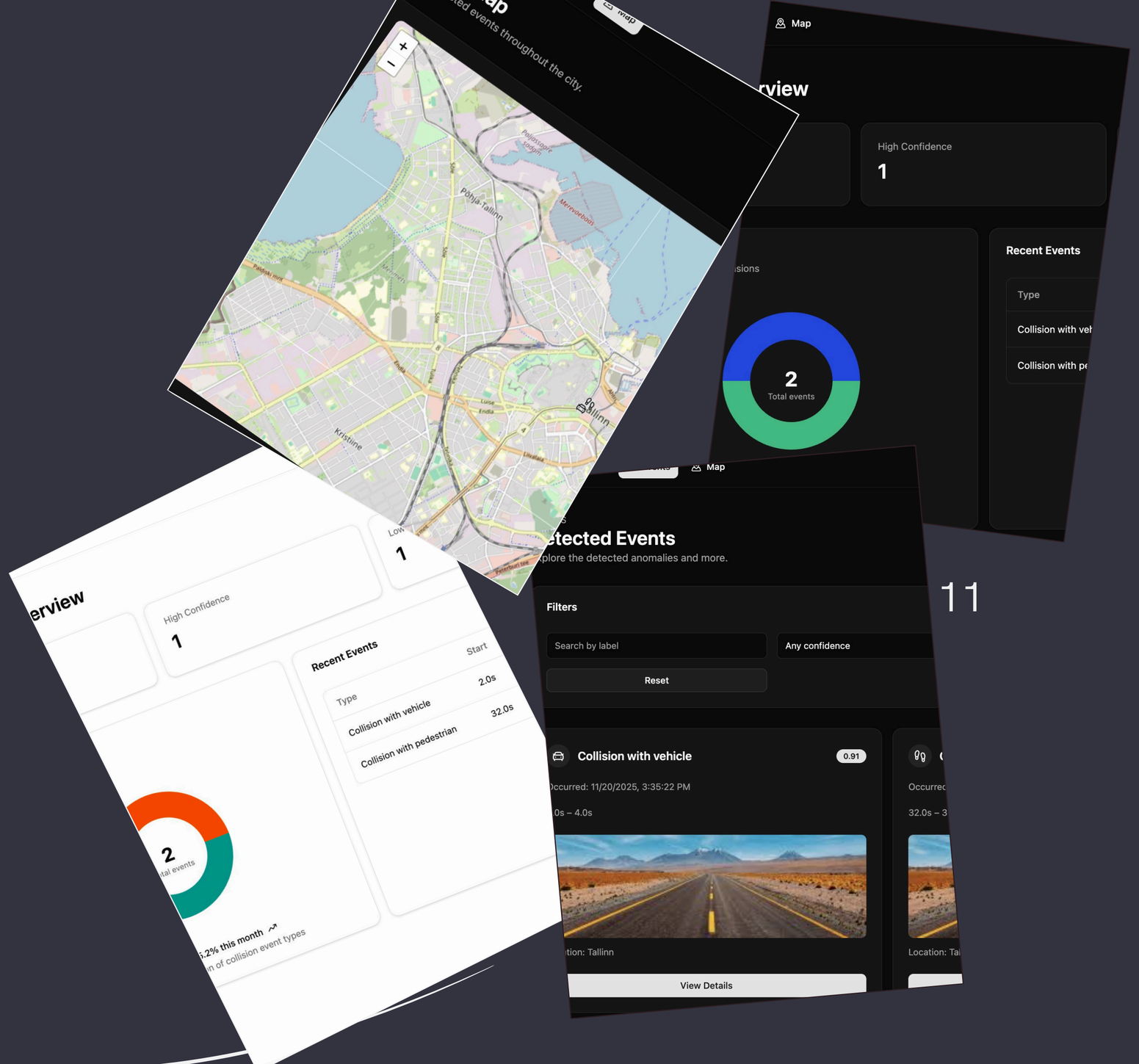
- Fully dockerized, ready for deployment

Next steps & Improvements

- Use data from dedicated sensors (geolocation, velocity) instead of using video for estimation
  - More accurate results
  - Saves time for analysis
- Implement real-time streaming/analysis
- Improve GUI and features (report, organizing events)
- Add face/car plate blurring to protect privacy
- Optionally allow non-public vehicles to join the program

Result

- APP


Map
High Confidence
1
Recent Events
Type
Collision with vehicle
Collision with pedestrian
2
Total events
Filters
Search by label
Any confidence
Reset
Collision with vehicle
0.91
View Details

Thank you for listening!