

Testbed-17 Moving Features: Autonomous Vehicle Analysis

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Autonomous Vehicle Study

- **StreetDrone Data (OS)**
 - Front-facing dashcam
 - Roof-mounted lidar
- **Moving Vehicle**
 - Position
 - Orientation
- **Goal**
 - Track nearby objects over time
 - Identify hazards correctly





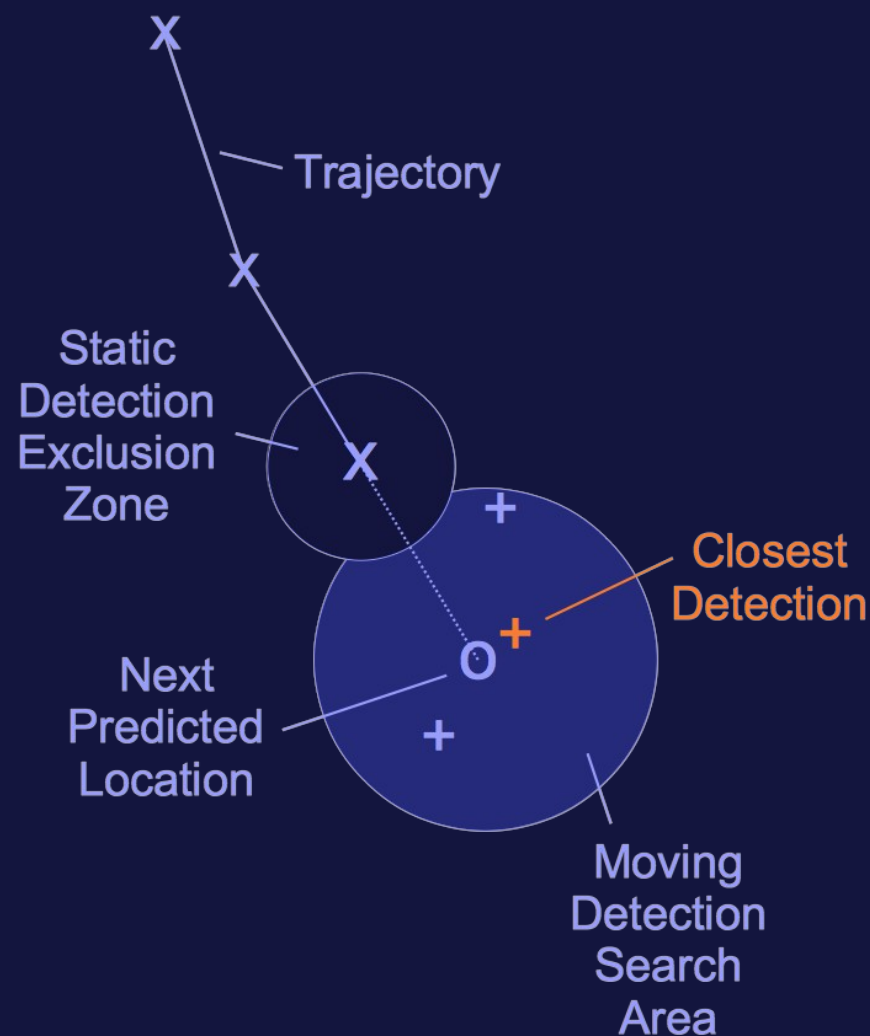
Sensor Data Aggregation

- **Synchronise Data**
 - Lidar detections
 - Video footage
- **Transform To World Co-ordinates**
 - Moving frame of reference
 - Vehicle position & orientation (OGC GeoPose)
 - British National Grid to WGS84
- **Export To WebVMT**
 - Previsualise in web browser



WebVMT Analysis

- **Export To WebVMT**
 - Sync data with video
- **Classify Detections**
 - Identify static detections
- **Analyse Data**
 - Associate detections
 - Aggregate results
- **Calculate Metrics**
 - Speed, distance, course





Results

- Moving Object Metrics

| Track | Duration | Distance | Average Speed |
|-------------|-----------|----------|---------------|
| Cyclist | 75.6 secs | 362.4 m | 17.2 km/h |
| Walker | 5.5 secs | 11.2 m | 7.3 km/h |
| Passing Car | 1.0 secs | 6.3 m | 22.6 km/h |



Conclusions

- **Identified Tracks From Detections**
 - Aggregated data from multiple sensors
 - Captured geospatial data from moving platform
 - Improved data value & quality
- **WebVMT Benefits**
 - HTML integration for previs & verification
 - Reusable tools
- **OGC Engineering Report: 21-036**
 - <https://docs.ogc.org/per/21-036.html>



Future Work

- **Multi-Sensor Analysis**
 - Multiple cameras
 - Aggregation over time & space
- **Traffic Cameras**
 - Traffic flow analysis
 - Automatic obstruction reporting
- **Collision Avoidance**
 - Proximity monitoring
 - Beyond line of sight