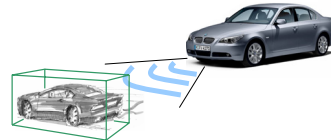


Multi-Sensor Classification using a Boosted Cascade Detector.

L. Walchshäusl, R. Lindl {Leonhard.Walchshaeusl, Rudi.Lindl}@bmw.de
 BMW Group Research and Technology • Hanauer Straße 46 • 80992 Munich



BMW Group
 Research and Technology



Experimental Vehicle

- LIDAR
- Far Infrared Camera
- Video Camera
- Internal Sensors

SENSORICS

Hypotheses Generation

- Raw Data Segmentation
- L-Shape / I-Shape detection
- Cuboid Hypothesis instantiation

Hypotheses Projection

- Projection of the cuboid back-side into the image planes.
- ROI enlargement.
- ROI scaling.

Hypotheses Verification

- Initialization of image stack
- Haar-Feature extraction
- Cascade classification
- Object tracking

ALGORITHM

Recognition Results

- Training with 600 positive and 1300 negative training samples.
- Recognition rate of 97 percent at a false positive rate of 0.01 percent (with uniform background).
- Recognition rate of 87 percent at a false positive rate of 10 false positives per hour (object tracking on autobahn).

EVALUATION

Key Points

- Experimental Vehicle equipped with LIDAR, Far Infrared Camera and Video Camera.
- LIDAR generates object hypotheses.
- Multi-Sensor Classification with boosted Cascade Detector.

SUMMARY