Welcome

Ursa Major ITP-Workshop - Multisensor truck counting system

- A new approach for high accurate truck counting and monitoring
- Application examples for high accurate truck counting systems

VoLTRA solutions gmbh
a member of Volkmann group

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Agenda:

1) **Introduction**
   1) Basics

2) **Sensors**
   1) GroundSens
   2) ScansSens
   3) MultiSens

3) **Application examples**
   1) ParkDetek - Truck counting and monitoring system
   2) Telematic controlled truck parking
   3) 3D Vehile measuring system
   4) Narrows warning system
   5) HeightSens overheight warning system

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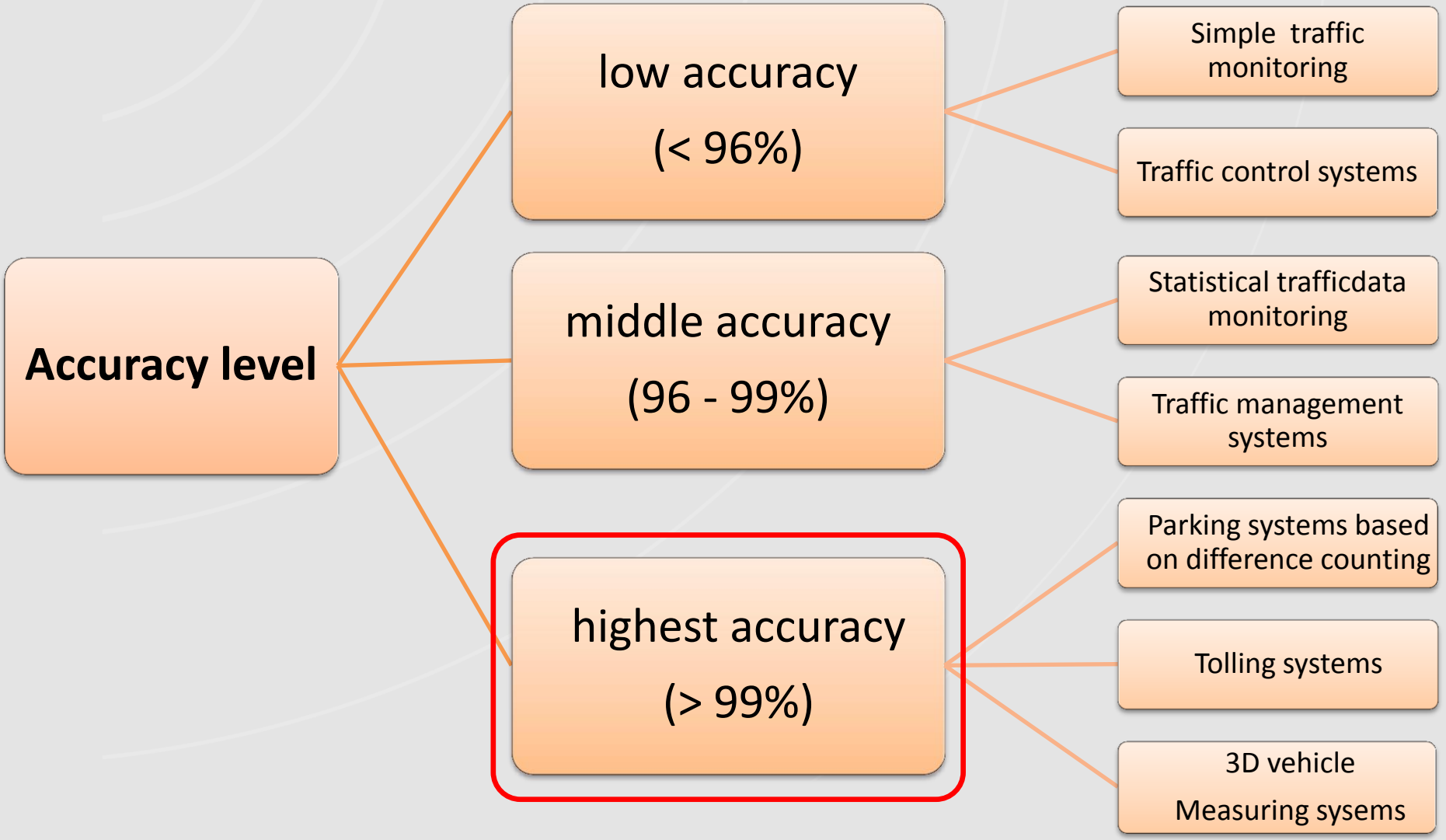
Accuracy levels of vehicle counting systems depending on applications



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GroundSens - Sensorconcept

- Road integrated radarsensor

  short distance to the bottom of the vehicles
  good radar signals due to the bottom surface of the vehicles

- Exact position sensing of the vehicles
- Length and speed measurement
- Full measuring function down to 0 km/h
- Works also in stop and go traffic

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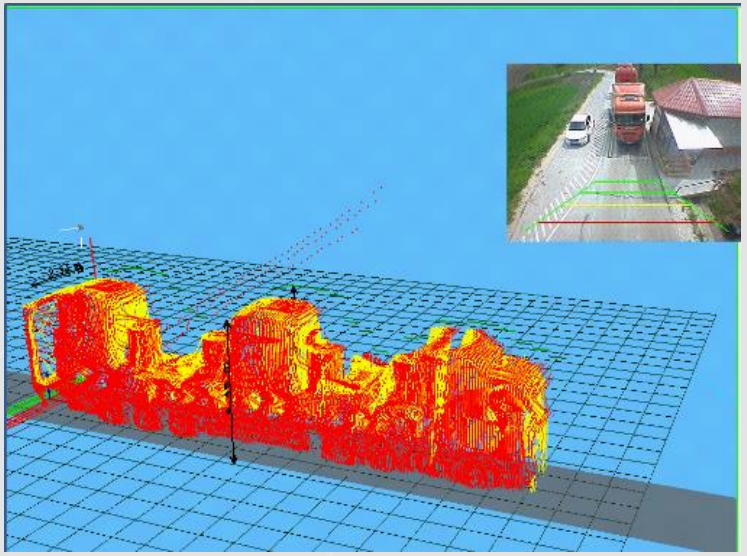
Outdoor laserscanner ScanSens®



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ScanSens - features

- Measuring of the exact profile of the vehicles
- Infrared laser scanning system
- Height and width measurement
- 60 Scans per second
- 96° Measuring range
- Works in all outdoor weather conditions

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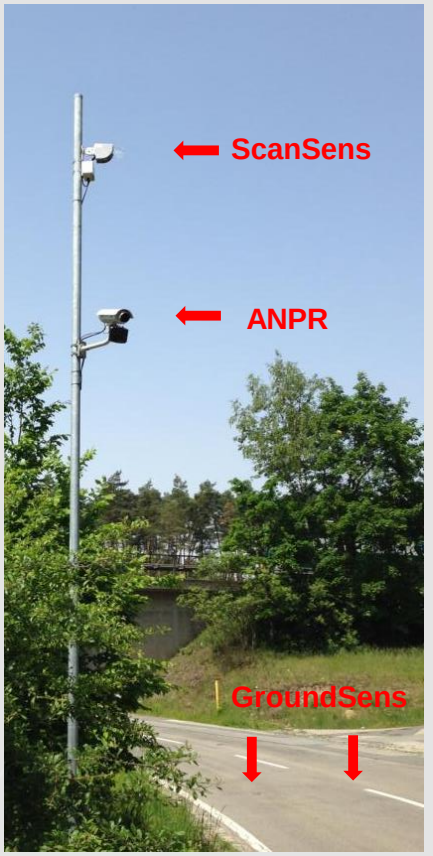
MultiSens®

- GroundSens®
- ScansSens®
- Automatic number plate recognition (ANPR)
- … other sensors
  - Axle detectors / WIM
  - Magnetic field sensors
  - Others…



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ParkDetek – Truck counting and monitoring

Typical requirements and conditions on parking areas

- Classification into 2 classes (car, truck)
- Ranking vehicles in the measuring field
- Standing vehicles in the measuring field
- Over wide lanes – up to 1m
- High frequentation of vehicles and less parking lots
- Passing vehicles
- Passing vehicles in opposite directions

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ParkDetek – Truck counting and monitoring

Advantages of difference counting systems:

- Only entry/exit counters can detect vehicles parking outside the official parking spaces (vehicles not parking correctly)
- Only few detectors are required - low system cost
- The cost does not scale with the size of the parking area
- Cost advantage especially for large parking areas
  Minimal civil works

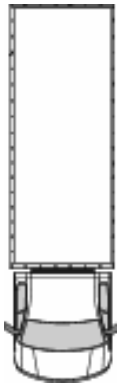
Requirements for difference based truck counting

Criteria 1: Classification accuracy

Criteria 2: Classification uniformity

Criteria 3: Long term accuracy

Frequentation per 24 h	Difference truck	Difference car	Test period
min.1000 vehicles	+ - 2 trucks	+ - 3 cars	10 days
3500 vehicles	**+ - 2 trucks**	**+ - 3 cars**	**10 days**

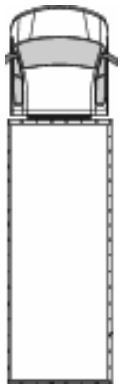


Most different driving situations…

- Standard forward driving

Most different driving situations…

- Überfahrt klassisch in korrekter Richtung
- Überfahrt in Gegenrichtung



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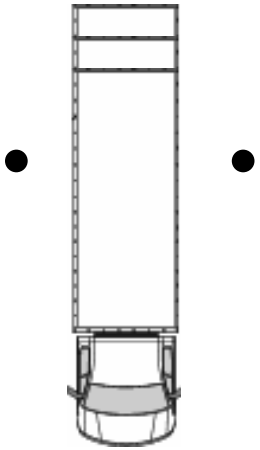
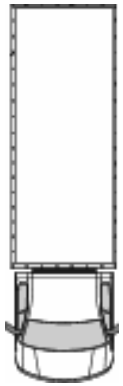


- Standard forward driving
- Backwards driving
- Stop and Go Traffic



Most different driving situations…

- Standard forward driving
- Backwards driving
- Stop and Go Traffic
- Ranking vehicles on the sensors

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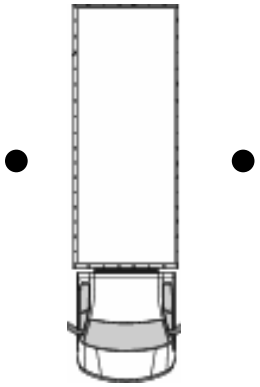
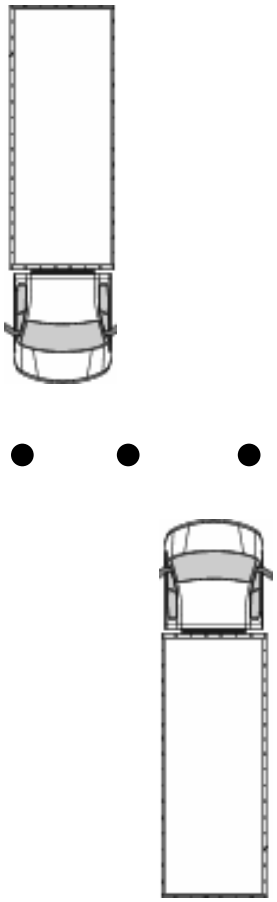


- Standard forward driving
- Backwards driving
- Stop and Go Traffic
- Ranking vehicles on the sensors
- Driving forwards over the sensors and returning then

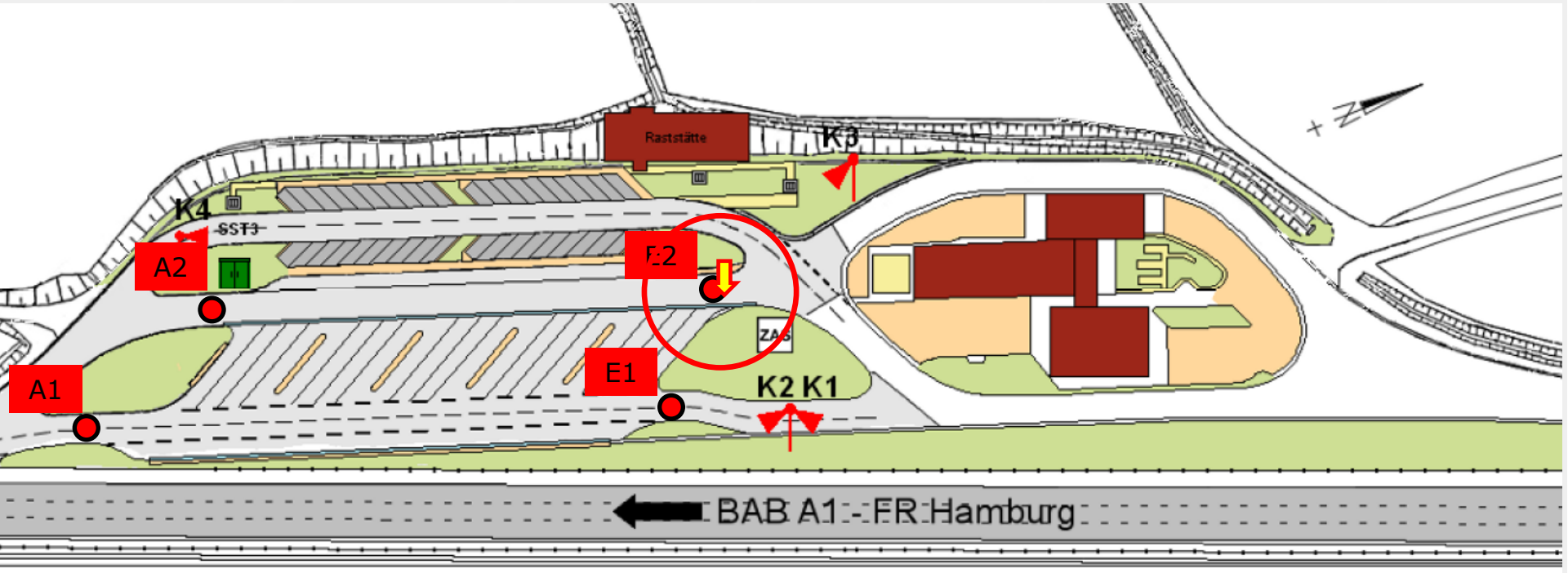


Most different driving situations…

- Standard forward driving
- Backwards driving
- Stop and Go Traffic
- Ranking vehicles on the sensors
- Driving forwards over the sensors and returning then
- Two vehicles occuring at the same time on the sensors

Lageplan Buddikate

- Detektion Punkte



TeamViewer

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Telematic controlled truck parking

M+C Lkw-Parksysteme GmbH & Co.KG
Dr.-Ing. Klaus Manns,
Südstraße 14

56422 Wirges

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Telematic controlled truck parking

- 2005 first Pilot projet with personell support „A3, Montabaur“ in RLP, Germany
- 2011 Development of a new **fully automatic** system design
- 2012 first implementation „A3, Montabaur“ with fully automatic function
- 2013 acceptance test of the system from a german test institut and Motorway authority Rhineland-Palatinate
- since 2013 systems runs stable without personal support …

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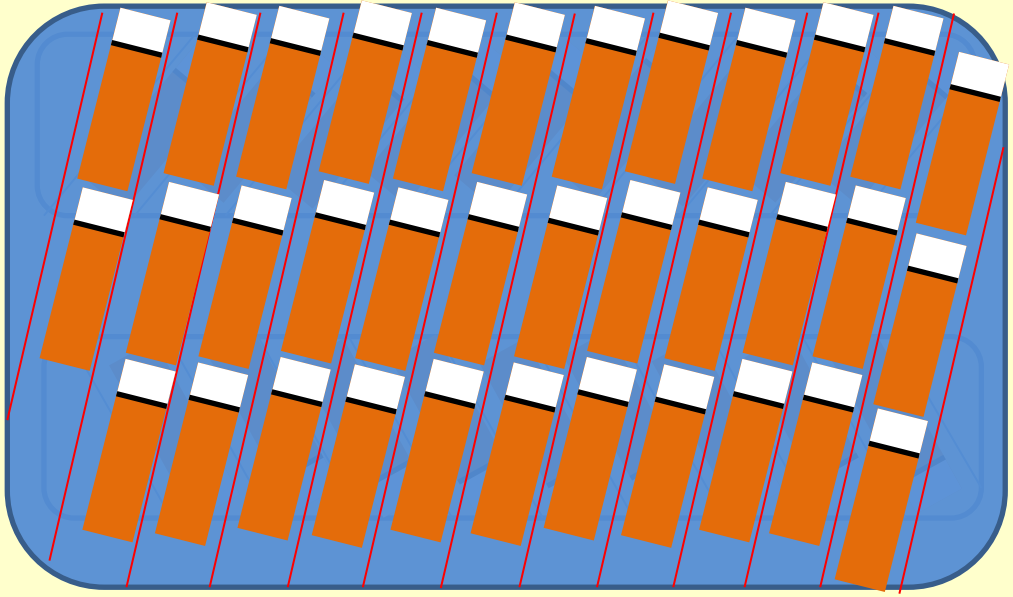
Optimization of existing parking areas …



38 LKW

48,57 % more Trucks on the same area

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Any questions ?

We stay at your service.

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