Commercial Vehicle Fleet Management System

Project goals

- Development of an on-board intelligent control and communication device for commercial vehicles
- Development of the theoretical basis for the fleet management software and hardware systems
Adapted On-board Unit

Commercial platform with GPS receiver, GSM modem, microcontroller, I/O ports, and CAN interface

Functions
- Position and navigation
- Operation and maintenance
- Vehicle and cargo safety
- Measurement and communication
- Remote diagnostics
- Driver analysis

Position and navigation
- GPS position and inertial correction
- Geographic information system
- Plan of the transportation routes

Vehicle and cargo safety
- Velocity restriction
- Temperature of the brake disk
- Deterioration of the brake shoes
- Estimation of road roughness
- Black-box function
- Detection of punctures
- Cargo hold temperature
- Stowaway recognition
- Door and tank-valve status
- Driver identification

Remote diagnostics
- Status of the failure lights
- Axle loads
- Pressure
- Battery voltage
- Failure memory
Experimental On-Board Unit

System architecture

Application areas
- measurement, data collection
- estimation of kinematical and dynamical states
- environment recognition
- positioning, navigation
- modeling, identification
- feedback control
- reliability enhancement
- unmanned operation

DataBase

New features
- adhesion coefficient estimation
- tire pressure estimation
- road surface evaluation

Unintended lane departure detection and avoidance

00.00 00.40 00.80

01.20 01.60 02.00
**Server Center**

**Main functions**
- Vehicle and fleet recording
- Logistics
- Dynamic fleet management
- Navigation and trace
- Maintenance and diagnostics

**Architecture advantages**
- Java prototype: modularity and security
- Independent feature development
- Easy scalability
- Customizable web interfaces

**Cooperating modules in vehicle navigation**

- Map download request
- Notification
- Position request
- Request for SMS sending