Advanced City Cars

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**Advanced City Cars**

- **Advanced City Cars (ACC)**
  - city vehicles with zero or ultra-low emission and driver assistance systems such as ISA, parking assistance, collision avoidance, stop&go, etc. Access control for car-sharing services

- **Dual Mode Vehicles (DMV)**
  - As ACC but able to support also automatic driving, limited to platooning for relocation of shared cars or fully automated as Cybercars
**Benefits of Adv. City Cars**

- City-friendly (low emission, small, ...)
- Safer, efficient, reduce congestions, improve manoeuvres
- Improve mobility
  - Elderly and disabled people
  - Historical city centres
- New mobility concepts
  - Advanced car sharing
  - Dedicated e-lanes
  - Cybertcars
Advanced Car Sharing

- Vehicle use is optimised, when parked the vehicles are always available
- The same number of vehicles could serve a larger number of users
- Less costs, better services
- Extra costs limited to dedicated lane and platoon drivers
Human factors

- How does the driver interact with CityMobil vehicles like Advanced City Cars and Dual Mode Vehicles?
- How should the interface design for CityMobil vehicles look like?

- Comparison of two interface design variants for a dual-mode vehicle on an eLane with acoustic and acoustic + vocal commands
**Human Factors**

- How do drivers react to unusual and critical events when driving highly automated on an eLane?
Human factors

- Interaction design and evaluation for a dual-mode vehicle driving on an eLane in a simulator and on a test track
Prototypes developed

Based on standard vehicle with modified
- Power train
- Steering, brake
- ADAS - sensors
- HMI
Sensing system

Front sensors with on-board processing

- Multi-layer Laser/LR/SR Radar
- Mono/Stereo camera

Rear sensors

- Ultrasonic Sensor Unit

DSP

Sensor Fusion Unit

Collision Avoidance Module

Trajectory planner

Planned trajectory
Guidance control

- Vision sensors
  - Obstacle validation
    - Lane detection
    - Lane parameters
  - Mission Path
- Obstacle sensors
  - Obstacle map
- Primitives
- Reference generator
  - Lateral control
  - Longitudinal control
- Vehicle Dynamics Measures

Actuators

12-13 May 2011 CityMobil Conference, La Rochelle
Test and showcases

Test Track

Orta 2010

La Rochelle 2008
Concept Fiat MIO

- Concept based on 11,000 ideas from 17,000 people from 170 different countries

- Features include driverless guidance in dedicated lanes, on route charging, four wheels electric drive.
Thanks for the attention

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- Fiat Mio exhibited in Turin for the Italy 150th anniversary, until November 2011