



Ontology Based Road Traffic Management

Public University of Navarre

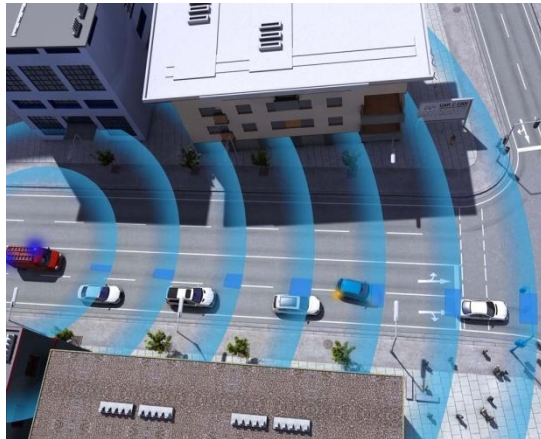
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OUTLINE

1. Scenario
2. State of Art
3. Solution
4. Conclusions
5. Future steps
6. Simulation

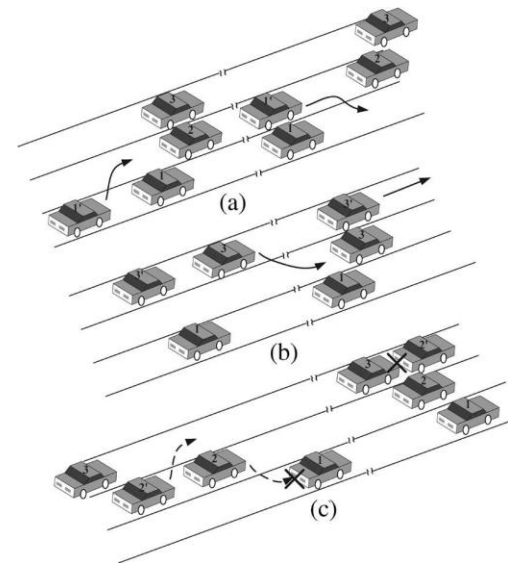
I. Scenario

- Emergency vehicle
- Free way
- Fast and Safe



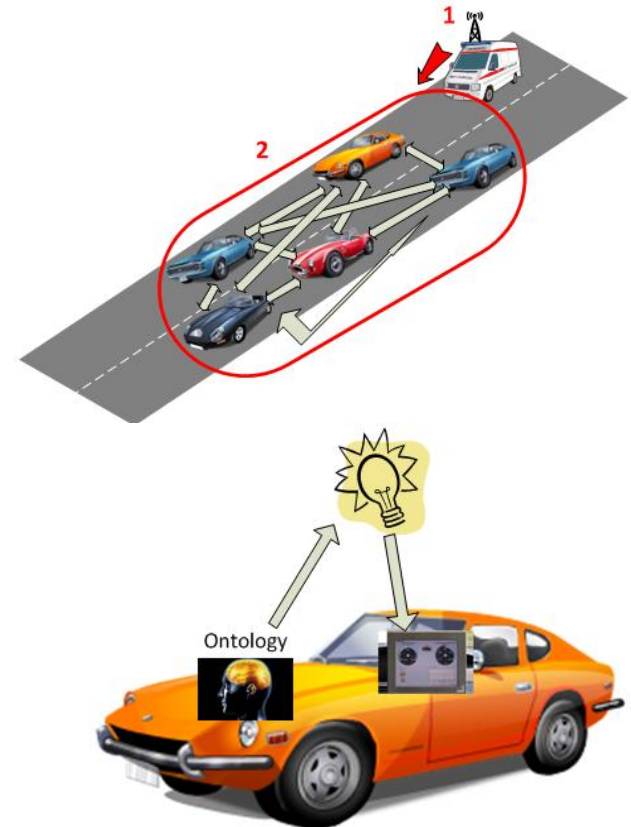
2. State of Art

- Plenty of projects
- No solutions
 - Dangerous scenarios
- Too basic solutions
 - Alternative routes
 - Alarm signal forwarding
 - Basic movements



3. Solution

- Distribute vehicles
- Minimum alteration in traffic flow
- System characteristics
 - Small areas
 - Distributed system
 - Collaboration
 - Fast decision taking
 - Individualized solutions

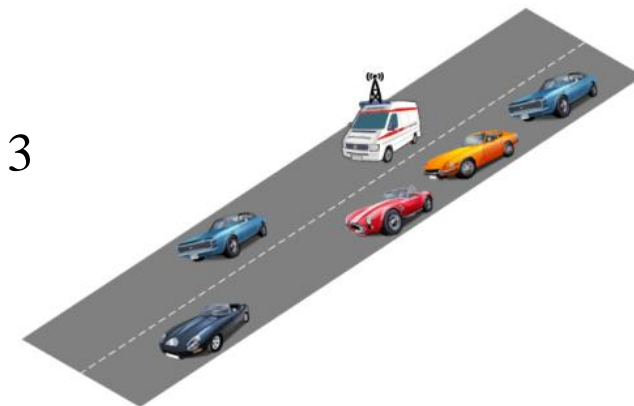
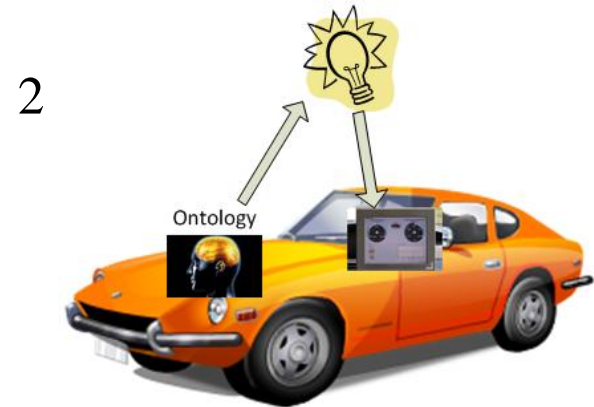
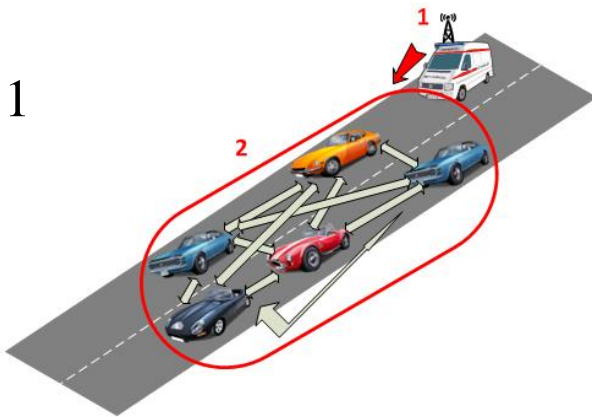


3. Solution

- ONTOLOGY
 - Decision taking system (SWRL rules)
 - Positions and speeds
 - Real-time solutions (Jess reasoner)
 - Consensus
 - Strategy
 - Vehicles to slowest lane
 - Gaps assignment

3. Solution

- System Architecture



Solutions:

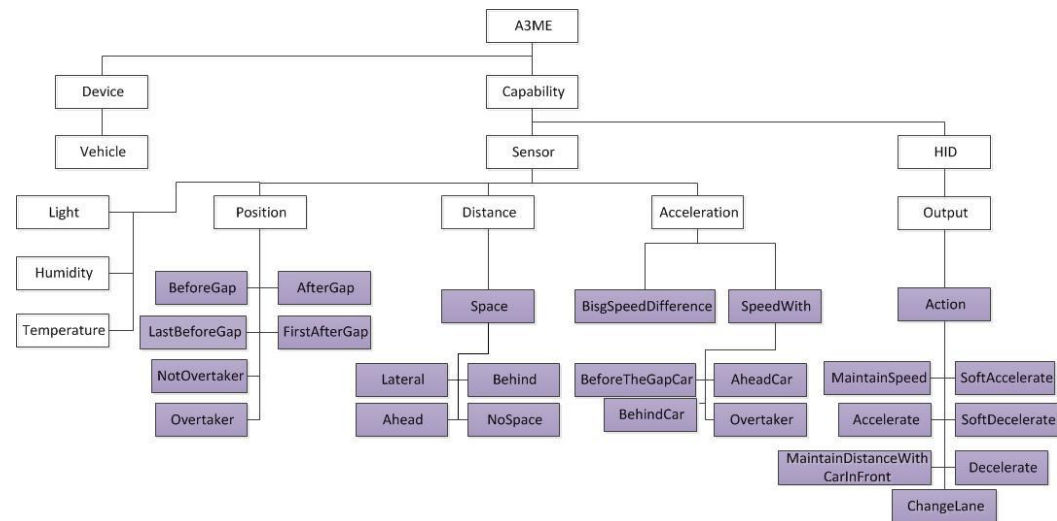
- Accelerate
- SoftAccelerate
- Decelerate
- SoftDecelerate
- MaintainSpeed
- MaintainDistanceWithCarInFront
- ChangeLane

4. Conclusions

- Real-time solutions (300 ms)
- Drivers:
 - No indecision
 - Straightforward execution
 - Common sense
- Continuous monitoring
- Other approaches:
 - Objects on the road
 - Reduction in number of lanes (traffic controls, road works, accidents,...)
 - Car accidents

5. Future steps

- Standardized ontology (A3ME)



- Complex scenarios
- Infrastructures
- Atmospheric conditions

6. Simulation

Questions?

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Thank you