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Multiagent Model for the Simulation of Drivers with the JaSIM Platform

François Guiot[2], Ludovic Henry[2], Stéphane Galland[12]
[1]IRTES-SET – Multiagent Simulation
[2]Computer Science Department
stephane.galland@utbm.fr
http://www.multiagent.fr

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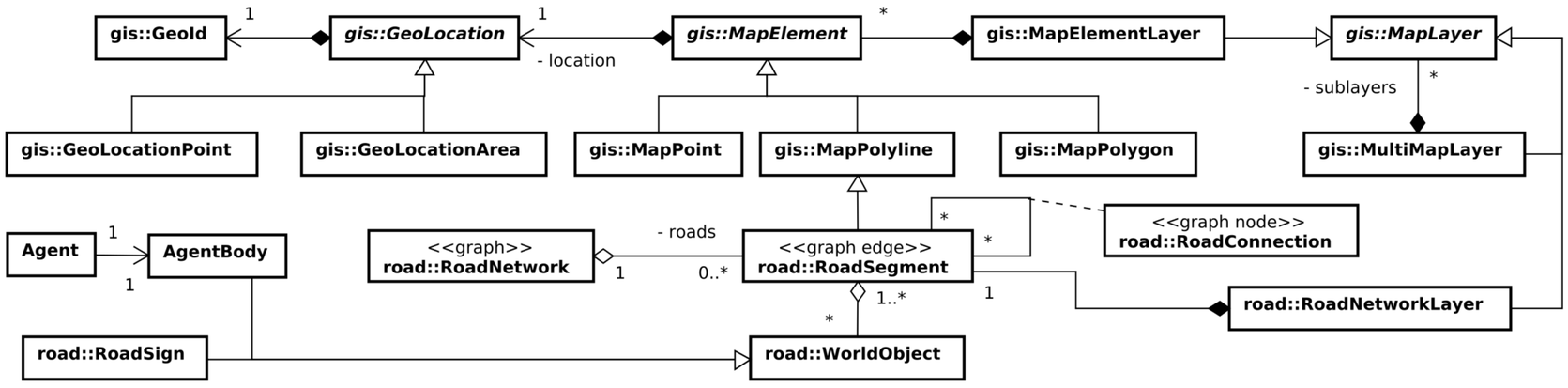
Context and Problems

- Simulation of individual drivers in large-scale systems.
- Simulation of the **collision avoidance** behaviors.
- Simulation of the **speed choice** according to road topology.
- Simulation of the **impacts of the physical properties** of the vehicles.

Environment Model: inspired by Geographical Information System



Behavioral Model

Collision Avoidance Behavior

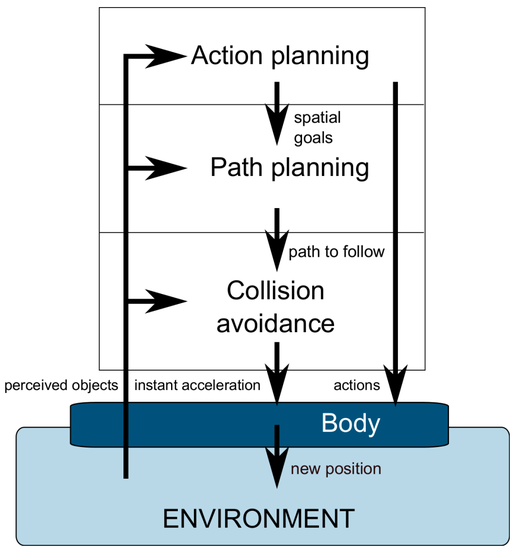
- Intelligent Driver Model: acceleration depends on the distance to the ahead vehicle *[Treiber, 2000]*

Adaptation of Speed to the Road Topology

- V_{85} standard, comfortable speed depends on the radius *R* of the road curve.

Simulation of the vehicule's dynamics

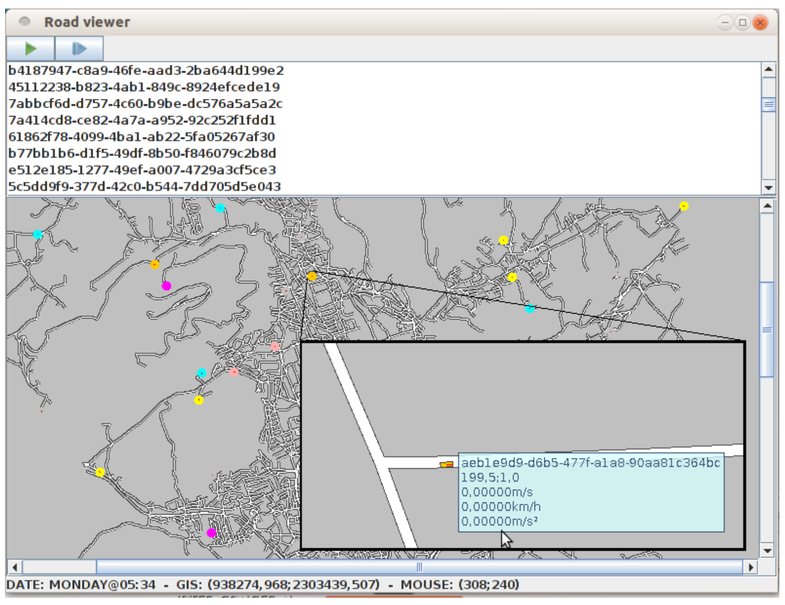
- The body (vehicle) provides a physics-based model of the vehicle *[Gechter, 2012, SIMPAT]*



Experimental Results: simulation of the area of Belfort

Study Case

- Area of Belfort (60000 road segments).
- Population of 5000 drivers for a day.
- Modes of transport: individual car, carpooling, bus network.



Results

- Reproduction of the standard "two peaks".
- Execution time is proportional to the number of agents.