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Cloud-based Decision Technology for Autonomous Driving

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Feature

Autonomous vehicles are often equipped with multiple high-performance computing platforms to achieve required self-driving capabilities, but high power consumption with high cost will be faced. This technology establishes cloud-based decisions and its integration technology to solve the needs of the computing platforms. The decision-making technology based on the cloud enables autonomous vehicles to receive correct neighboring cars/roadside information in advance for increasing safety. The scenarios that our technology can handle include car following, avoiding illegal parking, cut-in/out, intersection, etc.

Technique

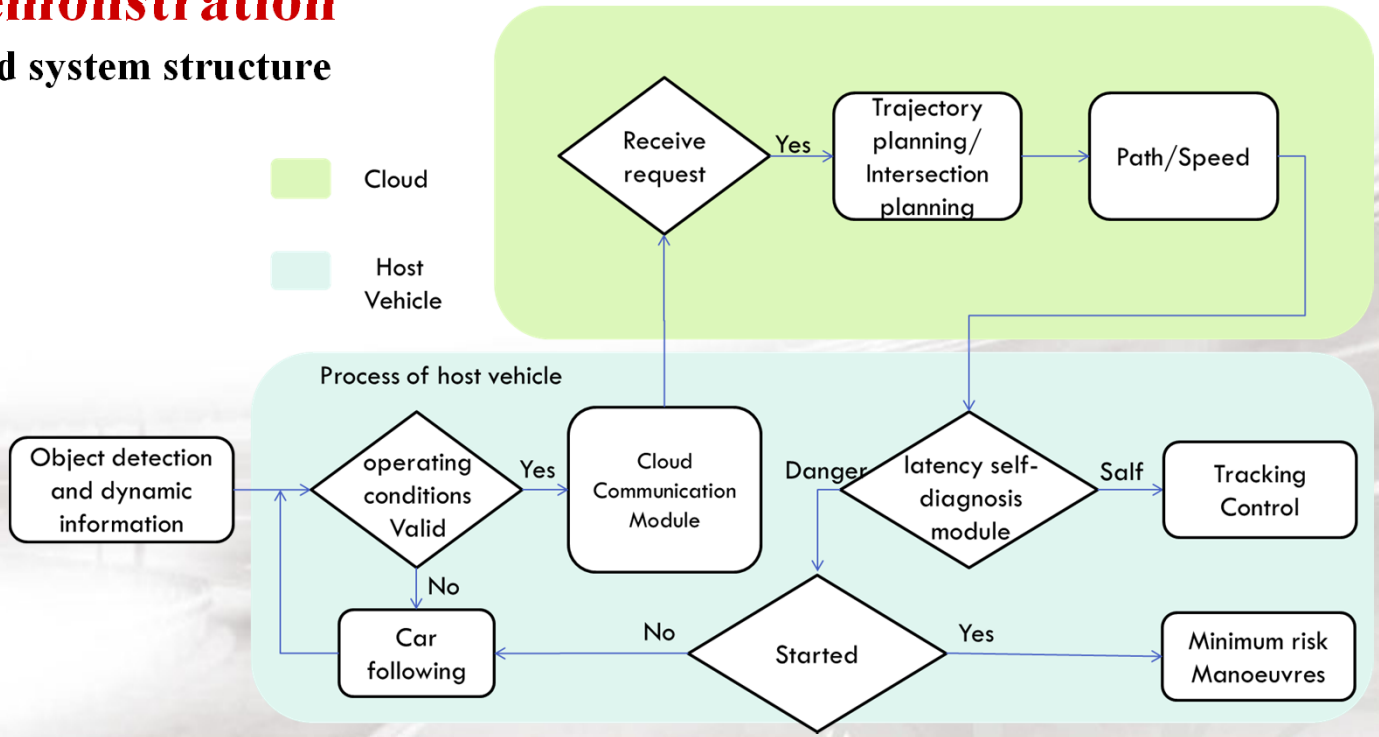
1. Communication algorithm between vehicles and cloud
2. V2V decision algorithm at intersections
3. Cloud-based trajectory planning and self-diagnosis technology
4. System integration technique

Specification

1. Speed range of host vehicle: ≤ 50kph
2. Localization error range for operation: ≤ 30cm
3. Detected range for operation: front>60m, left and right>20m
4. Latency of communication: ≤ 150 ms
5. Speed range of obstacles: ≤ 100 kph
6. Control error: ≤ 30cm
7. Scenarios that can be handled: car following, cut in and out, intersection with/without V2V, illegal parking, Car-hailing service for docking

Demonstration

Cloud-based system structure



TRL 6 On-road autonomous vehicle testing

Obstacle avoidance based on cloud decisions: The cloud is responsible for real-time dynamic trajectory planning, and the planed result is transmitted to the tracking control of host vehicle through the communication module until the obstacle avoidance behavior is completed.

Decision making based on V2V technology at intersection: Through V2V technology, the information of coming cars is transmitted to the cloud to plan the speed of the self-driving car generating the comity or passing behavior.