

KARYON: Kernel-Based Architecture for safety-critical control

Gulliver: A Test-bed for Developing,
Demonstrating and Prototyping Vehicular Systems

www.Gulliver-TestBed.net



Kernel-Based ARchitecture for safety-critical cONTrol

Vehicular systems are distributed systems

Transportation can dramatically
improve via distributed coordination

Vehicular systems are expected to gear vehicles with autopilot capabilities, improve safety, reduce energy consumption, lessen CO₂ omission...

Currently, these solutions are not allowed to operate on public roads, as the risk of causing severe damage cannot be excluded with sufficient certainty

Inherently Uncertain Environment



User



Environment



Communications

Control



**Highly Available
Complex Control**

How can we affordably validate the safety properties of future large-scale vehicular systems?

Sensors

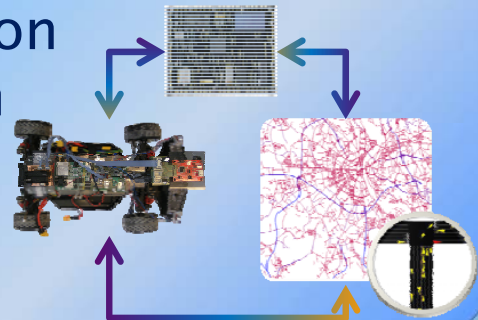
Gulliver: test-bed of miniature vehicles

Physical

Digital

We study opportunities for simulating vehicular systems using physical and digital components

- ✓ Large scale digital simulation
- ✓ Hardware-based simulation
- ✓ Mixed test-bed validation



Gulliver: A Test-bed for Demonstrating and Prototyping Vehicular Systems

Lies between

mathematical computer simulation and

By bridging between digital and physical simulation, we provide a platform in which research ideas can pass to the industry in the area of automated driving

- State:
 - Increased traffic throughput and safety without building new roads

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