

## Multiagent Simulation on StarBED

**Deploying Agent-based Traffic Simulation on StarBED** 

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Goal: Build a generic framework for distributed, multi-purpose, and large-scale multiagent simulation. Our initial simulation domain is car traffic simulation. The framework is a testbed for general purpose Computational Intelligence.

Why did we adopt the agent paradigm?

- Agents are autonomous entities (run in parallel), reactive, collaborative and goaloriented.
- They can reproduce complex behaviors like vehicles motion, drivers, sensors, etc.
- They can coordinate in real time and solve complex problems.

## Architecture on StarBED Our layer Pluggable Mechanism Organization Routing Coordination **Encounter Protocols** MAS Pluggable **Behavioral &** Strategic types? Agent $\theta 1$ Agent $\theta 2$ Agent $\theta 3$ **Economic type** Risk aversion? Uncertainty aversion? Agent Preferences? Cooperative behavior? Embedded Mobile Web IP Phone **Twitter** Navi app People behavior Android Sensor Car Nodes Emulation **Physical Simulation** (Terrain data) Pluggable **Physical state** プロバイダ Wireless Satellite com **Net Emulation** Pluggable Failures, Wired Wireless Wireless **Determination of** etc. (LTE) (Ether) (Wi-Fi) the affected areas **Physical Layers StarBED** Scenario

Example: Simulating traffic coordination in a disaster situation involving car-embedded & mobile app agents representing risk seeking, uncertainty averse drivers (only  $\alpha$ % are cooperative). The coordination mechanism uses a sensor network acting as a feedback mechanism for congestion prediction.

