

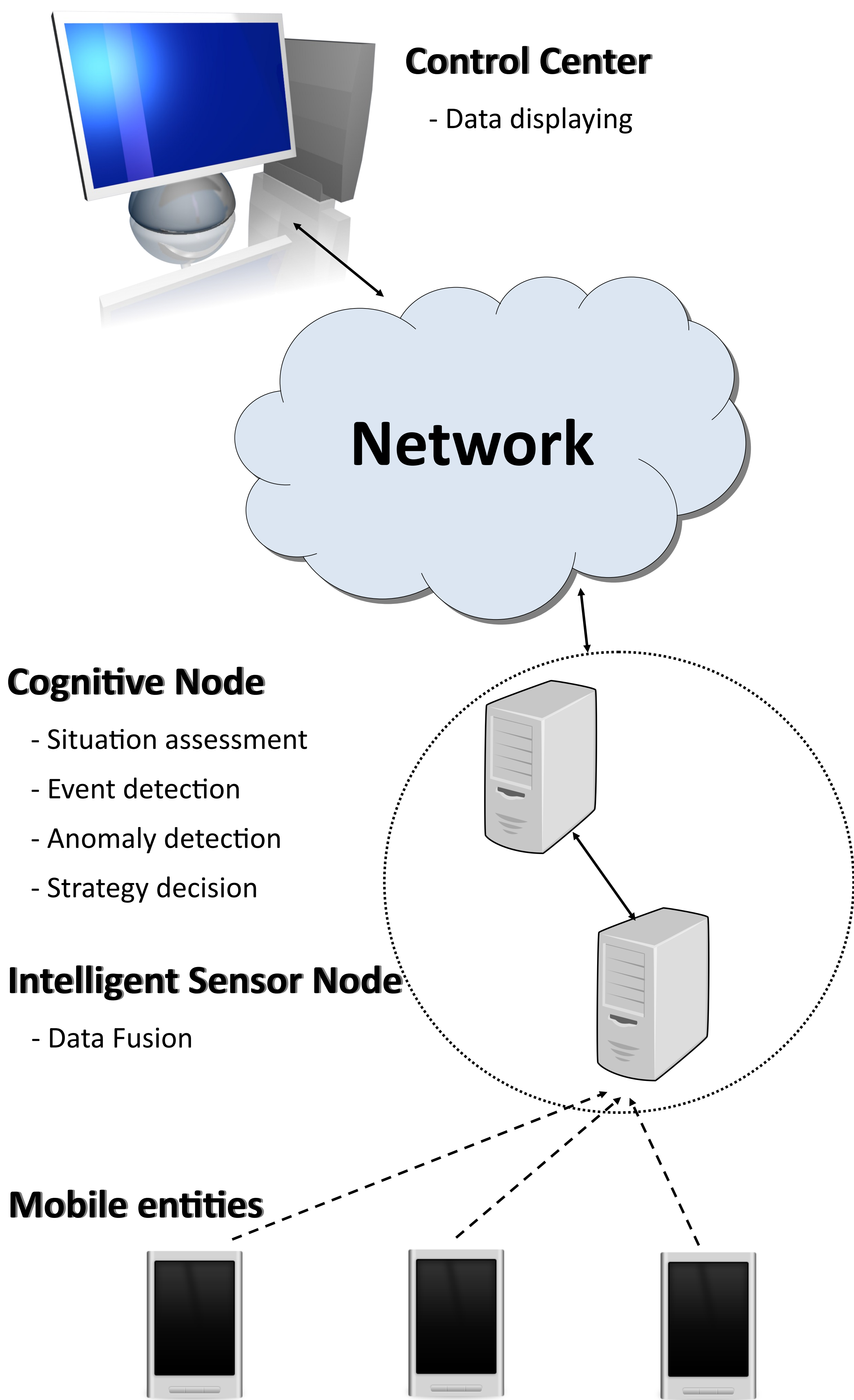


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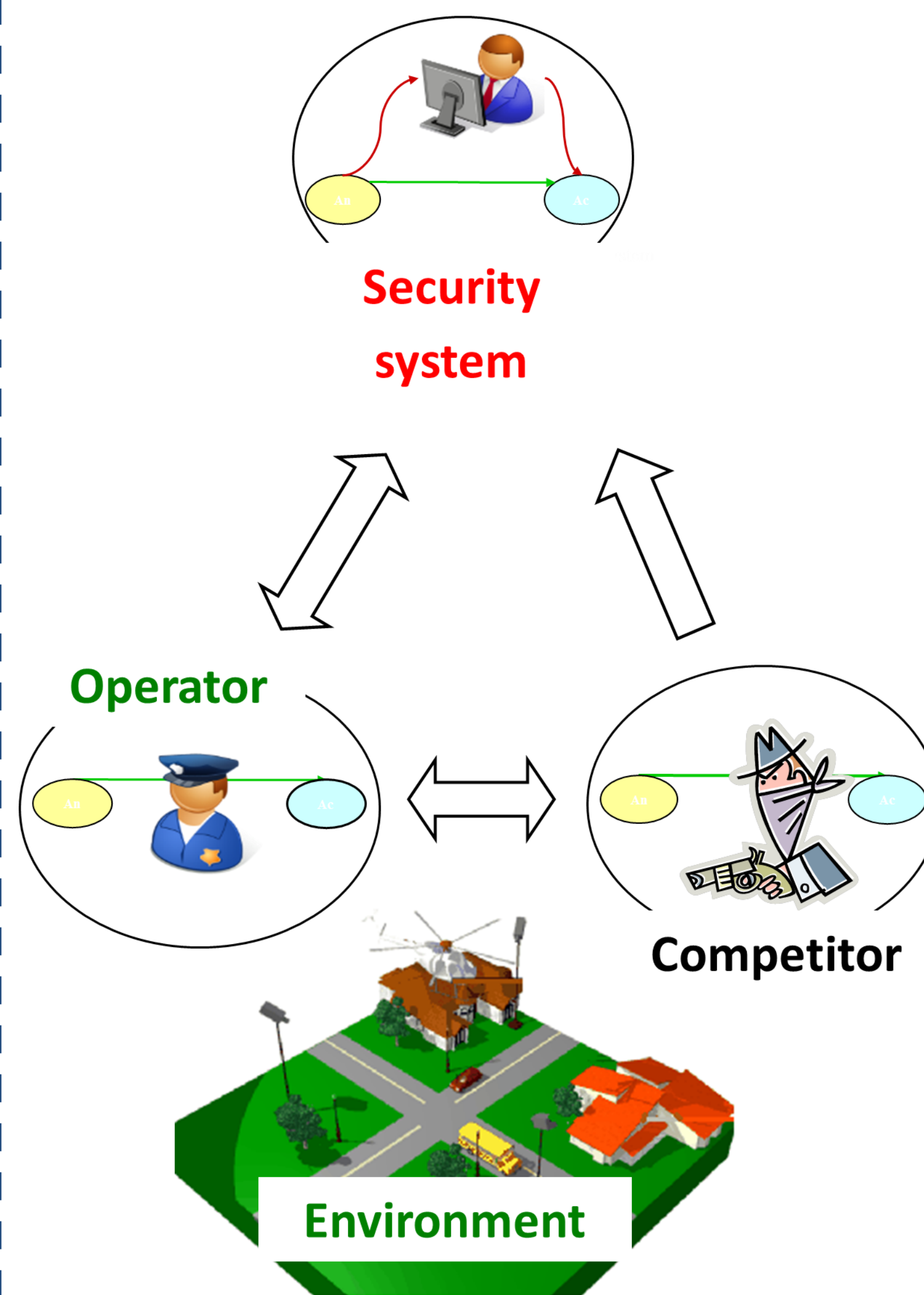
pilot embedded Systems archItecturE for multi-Layer Dependable solutions



DIBE—University of Genoa



Cognitive Node



Interactions are modelled by means of **COGNITIVE CYCLES**.

Interaction typologies:

- **Cooperative cycle** (system - HW)
- **Partially cooperative cycle** (system - operator)
- **Non cooperative cycle** (system - competitor)

A dynamical prediction on the evolution of the scenario is made. The system is aware of the resources at its own disposal to interact with the environment.



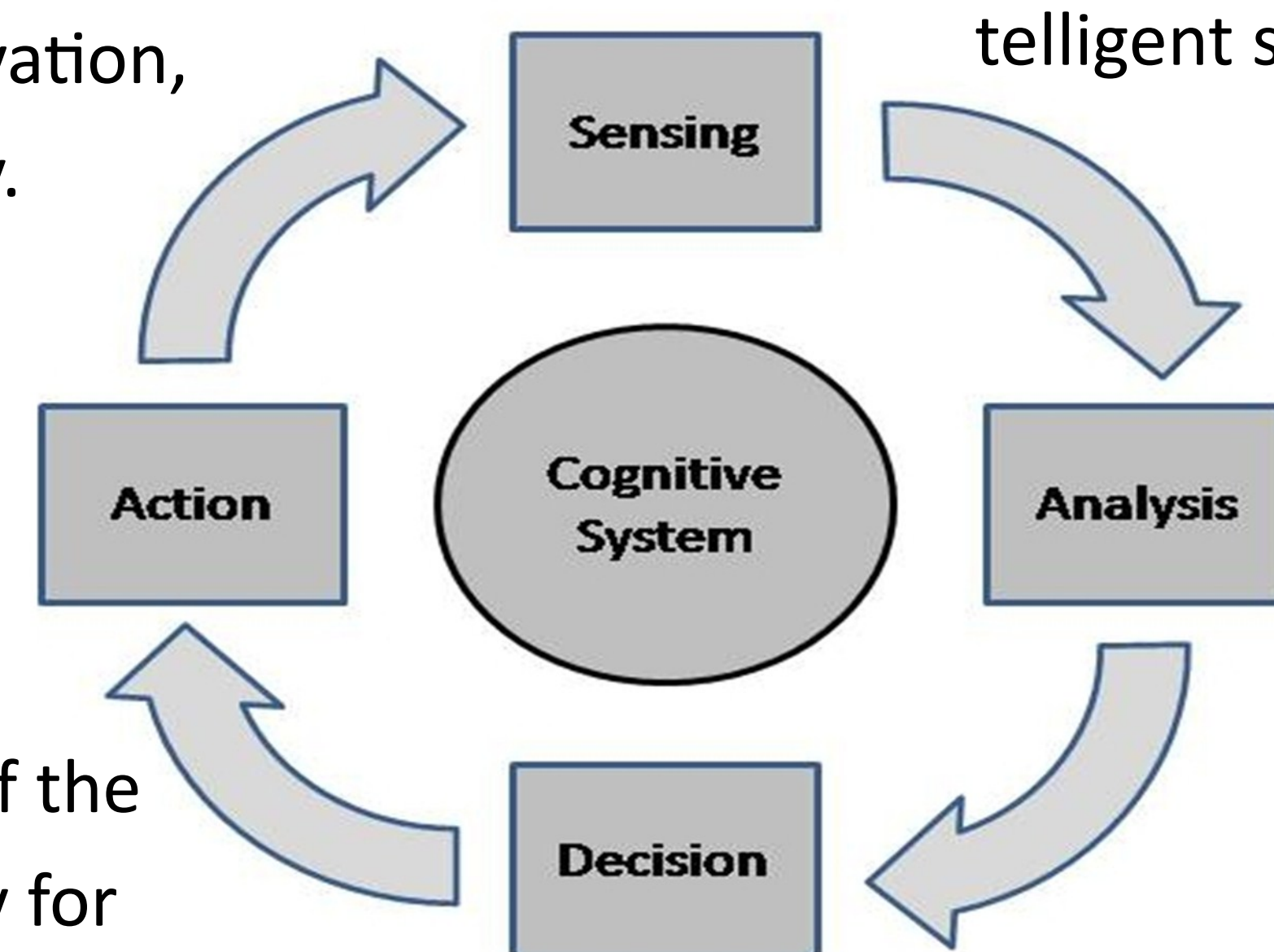
Cognitive Node and **Intelligent Sensor Node** can run on the same **embedded** machine.

A computer module based on OMAP35xx and new DM37xx processor designed for industrial and commercial market, that communicates via 802.11b/g, Bluetooth 2.0 and USB, was used.

Cognitive Cycle

Action: communication of specific operative instruction to the operators, actuators activation or deactivation, change tx frequency.

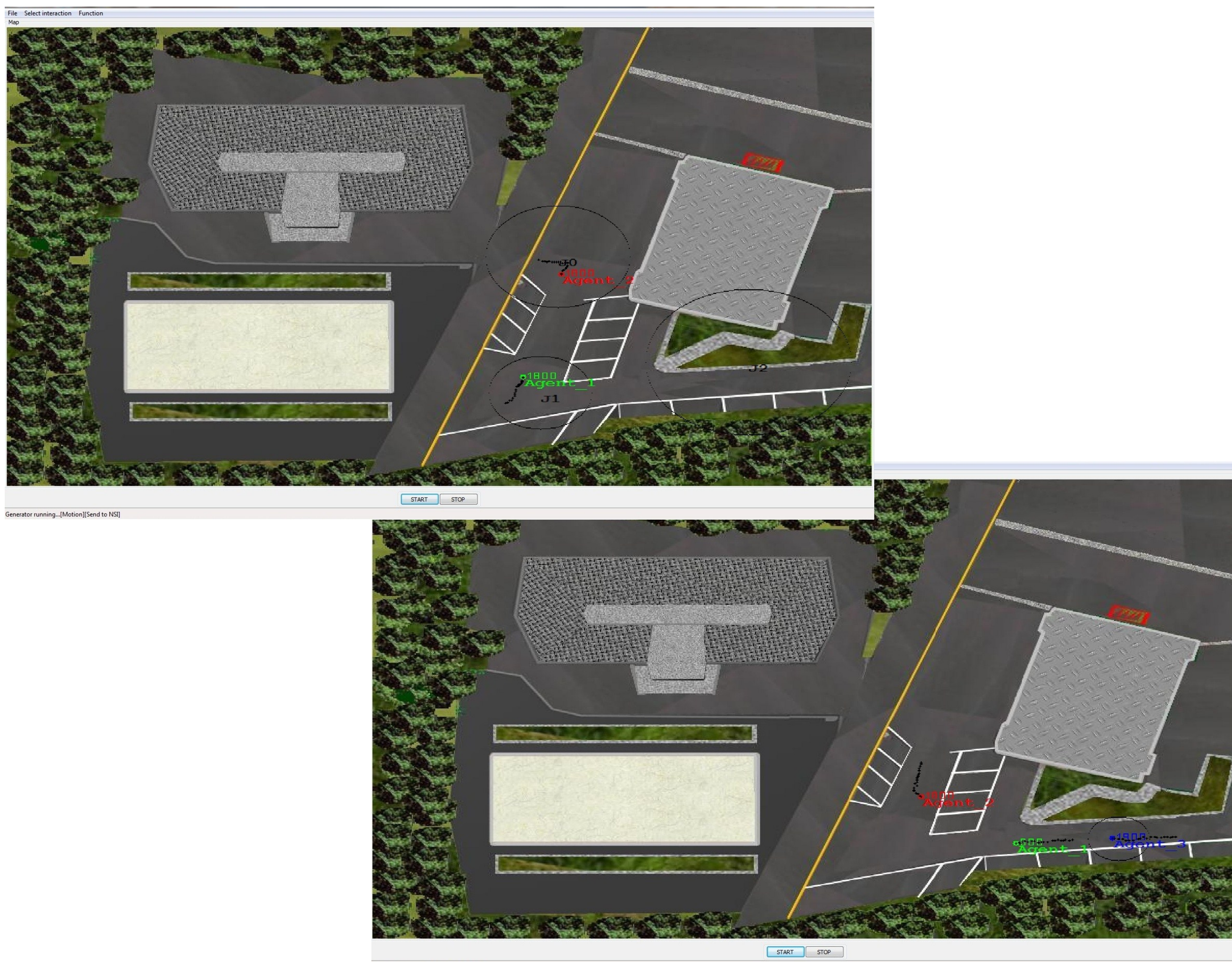
Sensing: gathering of the positioning and crowding information outputted by the intelligent sensor node.



Decision: decision of the appropriate strategy for the operator or for the employment of the actuators present in the area.

Analysis: analysis of the situation based on the learned experience.

PC-based cognitive node demonstrator



DBN Interaction Modeling

The sequence of events is represented by a statistical graphical model (DBN) in order to introduce a mathematical description of the empathic interaction model.

