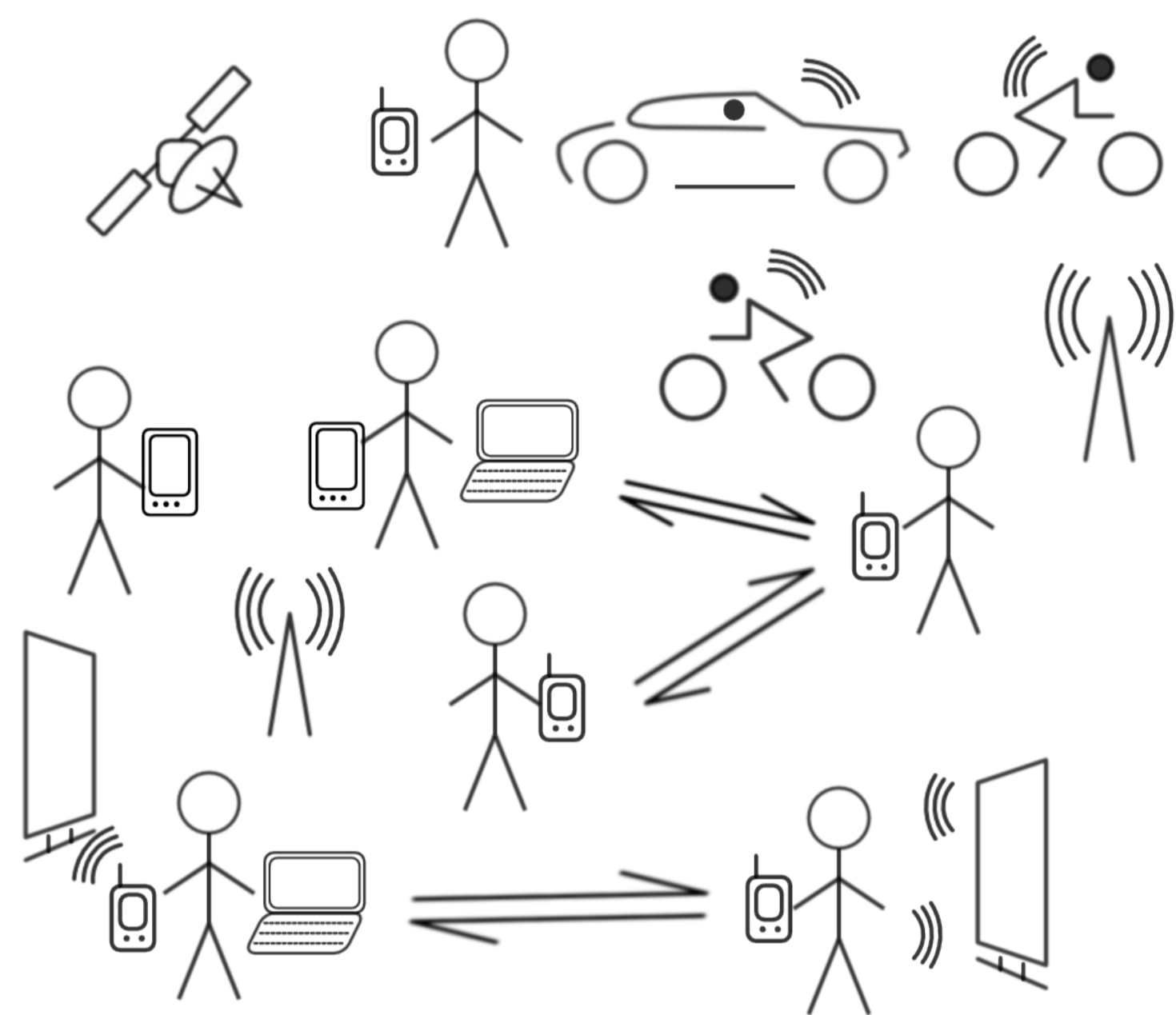


Emergent Behaviour for the Distribution of Information in a MAS

Creating a middleware for exchanging information in an Aml environment

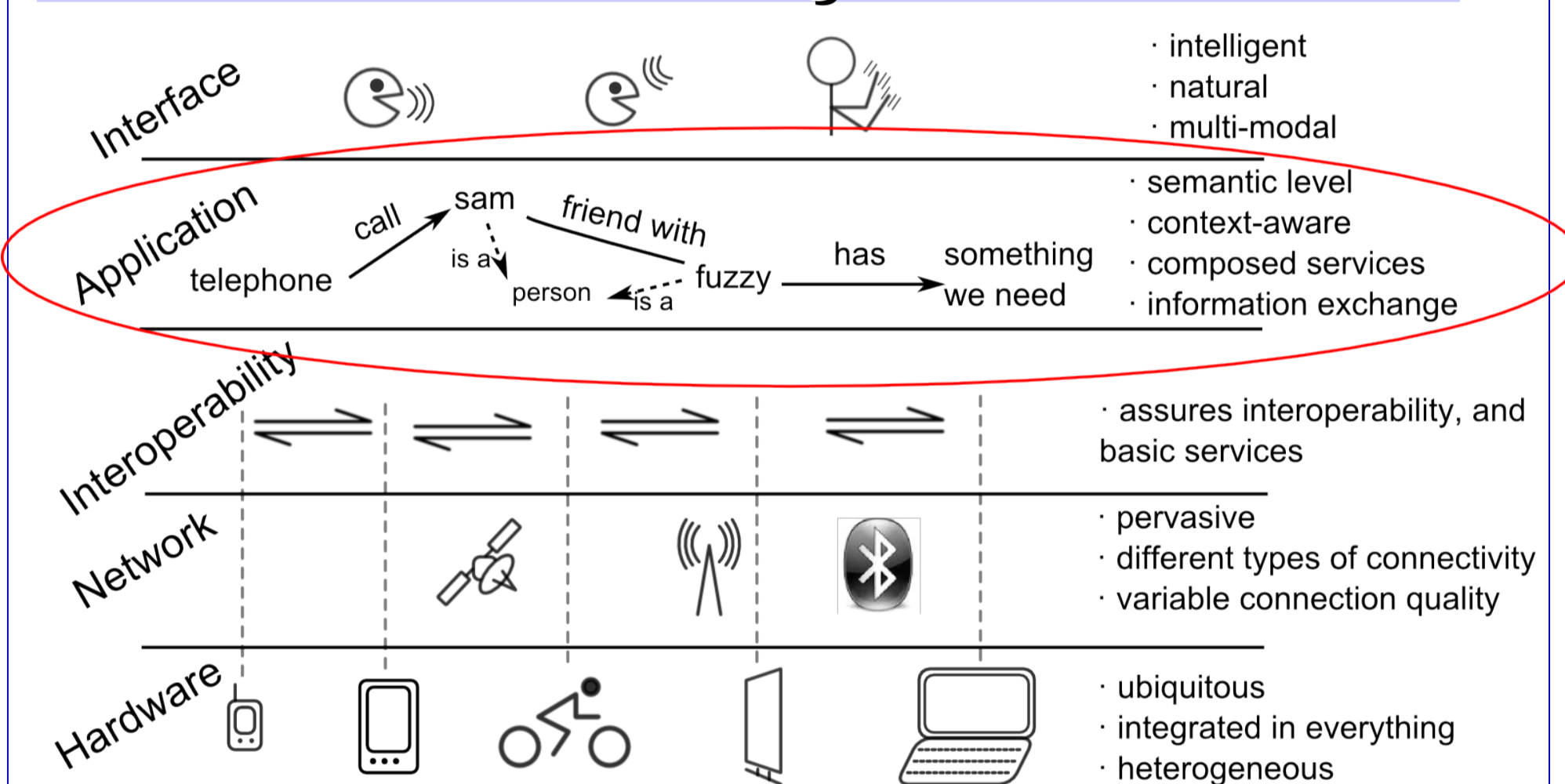
Definition

Ambient Intelligence is an ubiquitous electronic environment that supports people in their daily tasks, in a proactive, but "invisible" and non-intrusive manner.



People - Devices - Communication

Aml Layers



Challenges

- the users must get the information that is interesting / relevant to them

→ **context-awareness** is needed to compute *relevance*.

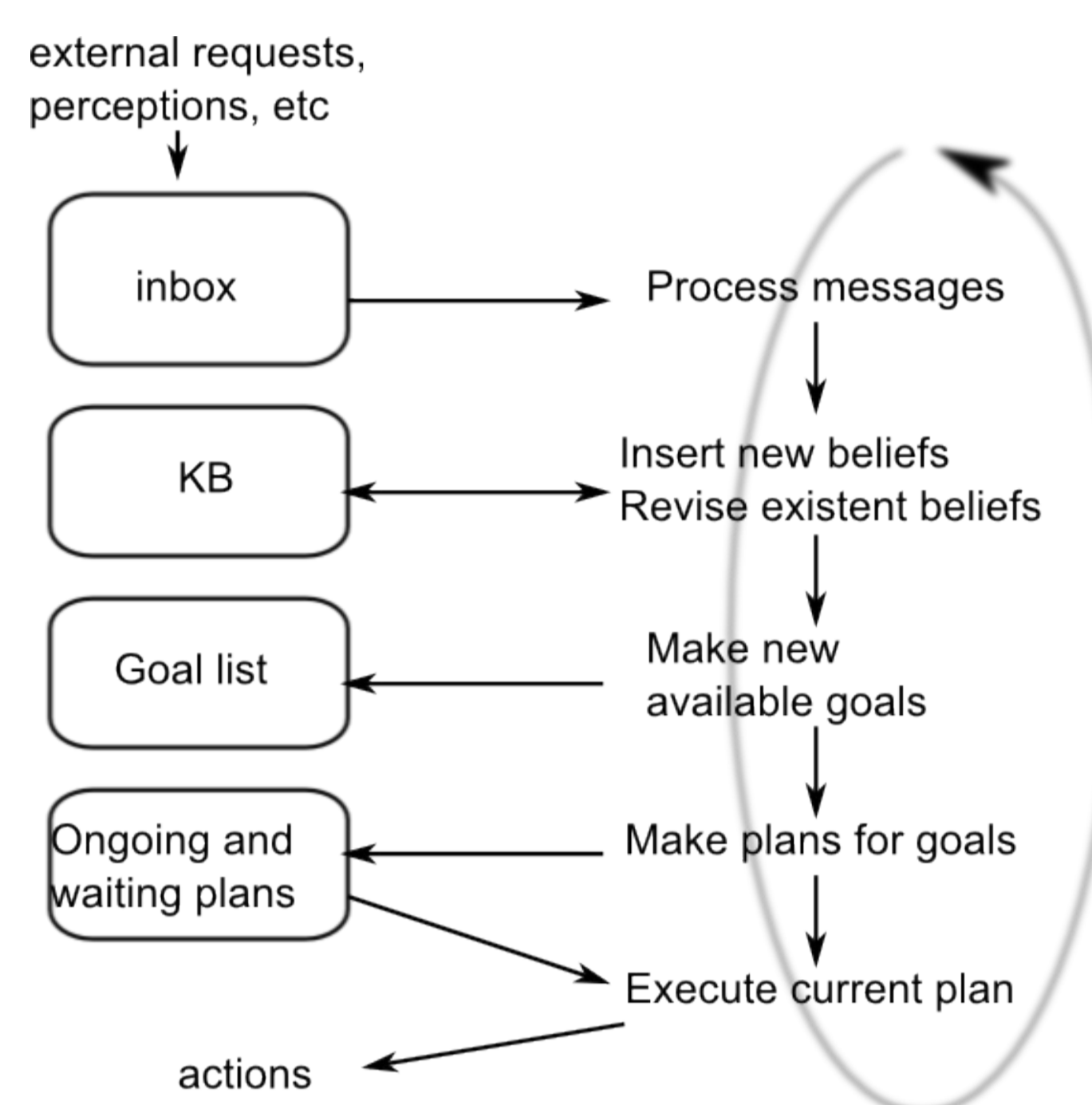
- Ambient Intelligence must be reliable and dependable

→ **distribution** is absolutely necessary.

Our goal: Build a Multi-Agent System for the context-aware sharing of information.

Implementation

Agent structure:



Agent structure

Facts represented as:

(Agent, knows, Fact)

Measures of context associated with facts:

□ **Pressure** - translates directly into relevance of the information - controls how fast the information spreads.

□ **Specialty** - specifies to which domains of interest the information is related - controls the direction of the spread.

□ **Persistence** - specifies for how long the information is valid - controls the time for which the information will remain in the system.

□ **Space-locality** - the information spreads around its source.

Measures of context associated with the agents:

- **Pressure** - controls the balance between reasoning and execution.

- **Specialty** - controls the domains in which the agent is interested.

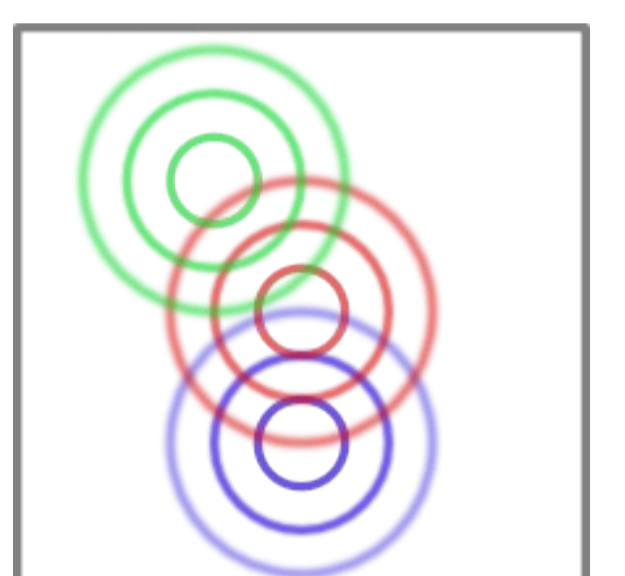
Results

□ Test scenario:

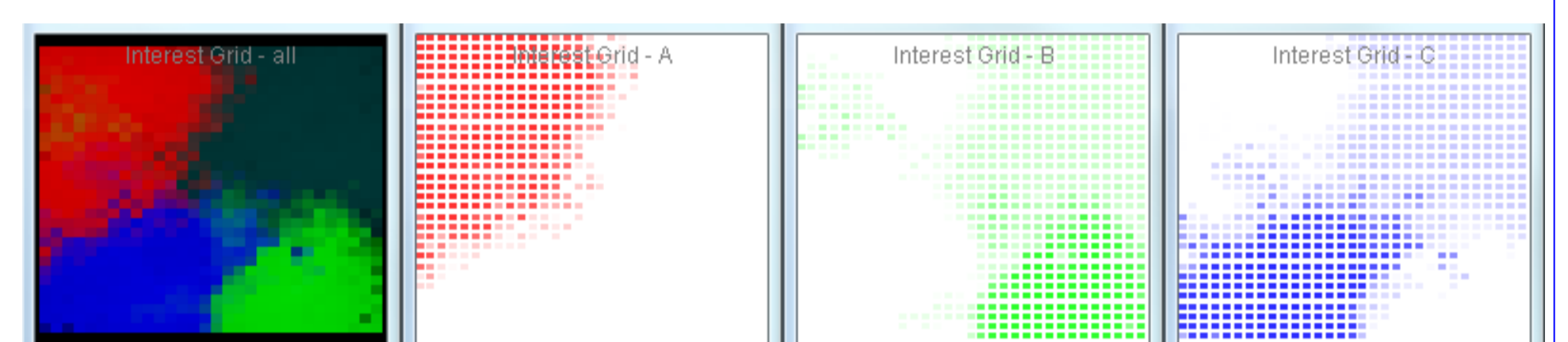
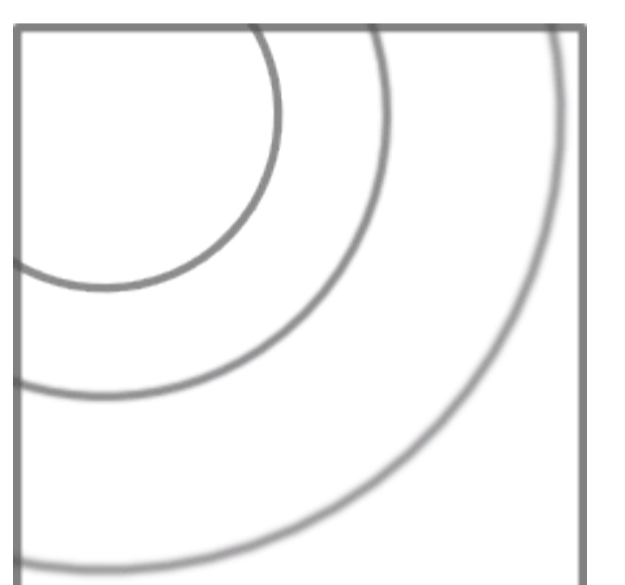
- create a certain distribution of interest - by inserting facts with low persistence and pressure, and different specialties.



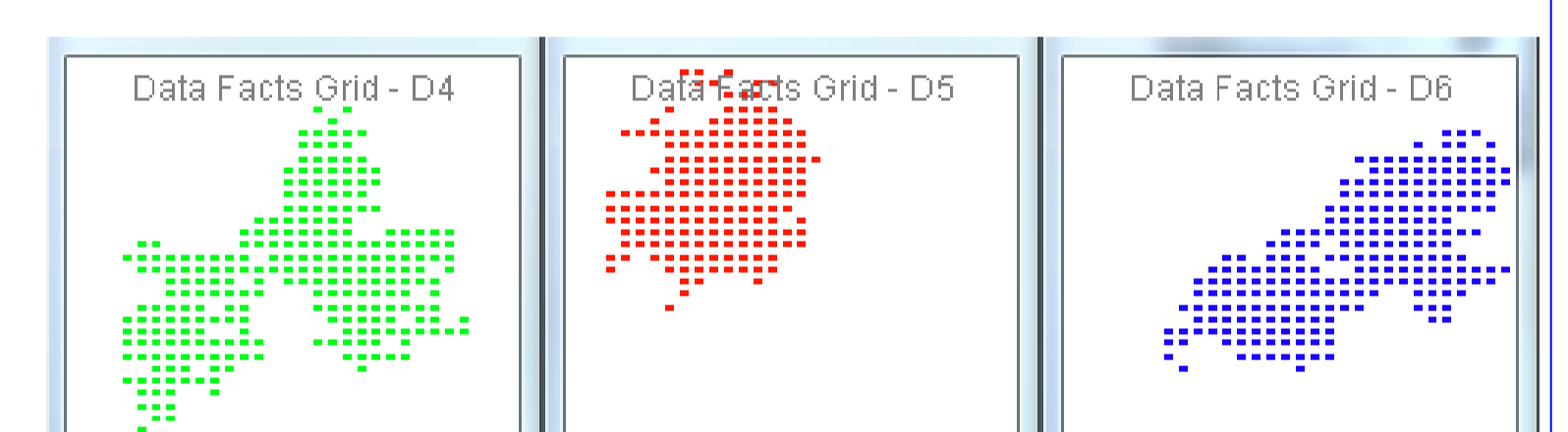
- test the behaviour of the system by inserting 3 data facts, of different specialty, with medium pressure and high persistence.



- test the behaviour of the system by inserting 1 data fact with high Pressure.



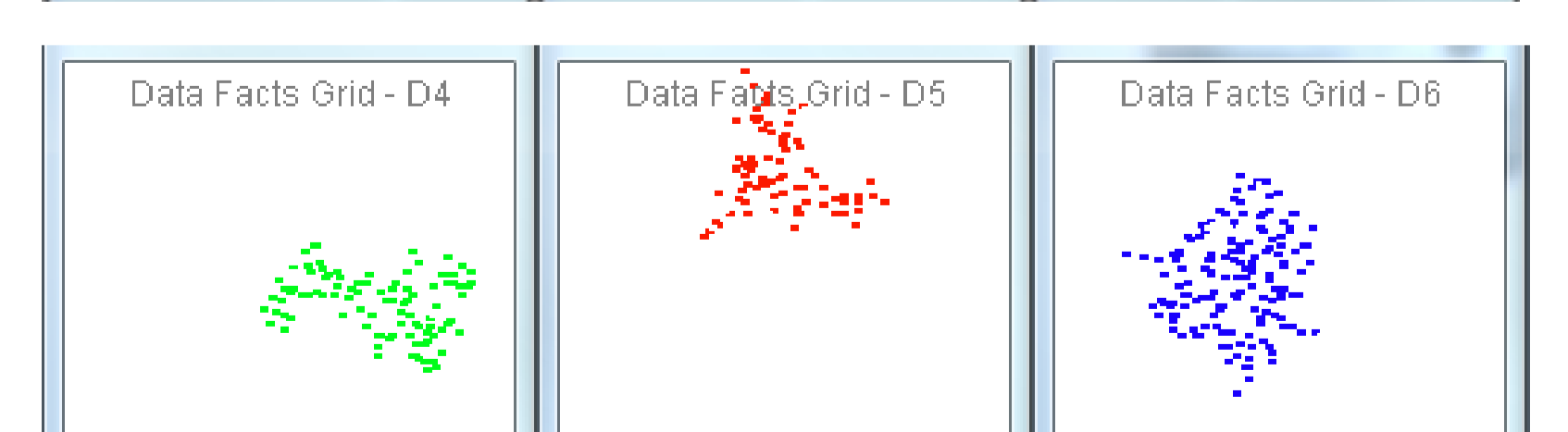
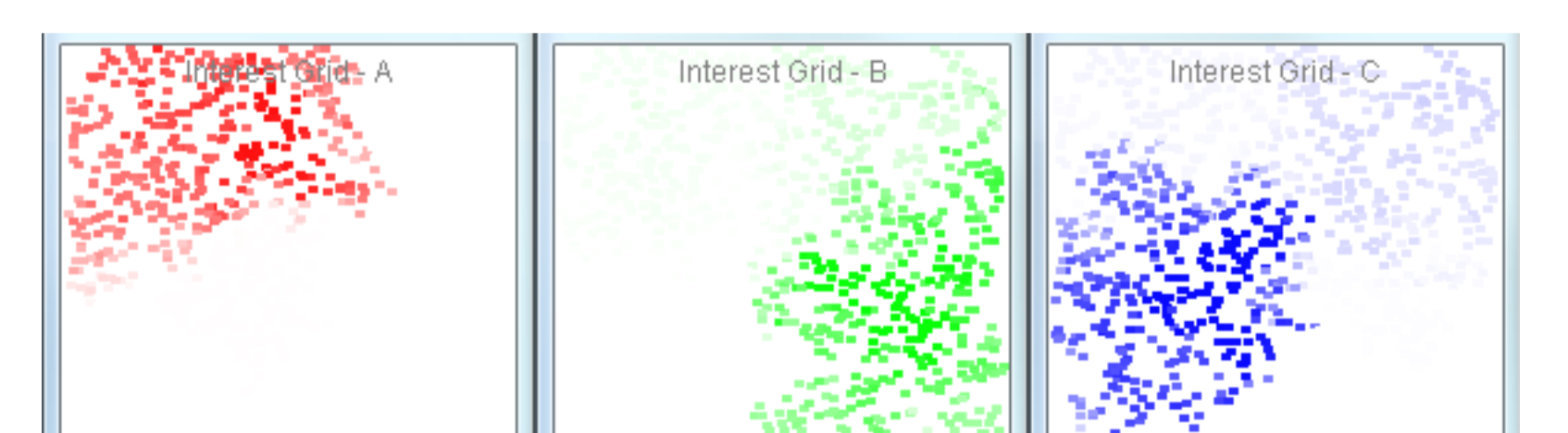
Interest map interest-domains A, B and C



Distribution of facts related to domains B, A and C, respectively



Distribution of two facts with high pressure



Experiments with agents placed randomly.