

University "Politehnica" of Bucharest



Artificial Intelligence and Multi-Agent Systems Laboratory



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Laboratoire d'Informatique de Paris 6

A CONTEXT-AWARE MULTI-AGENT SYSTEM FOR AMI ENVIRONMENTS

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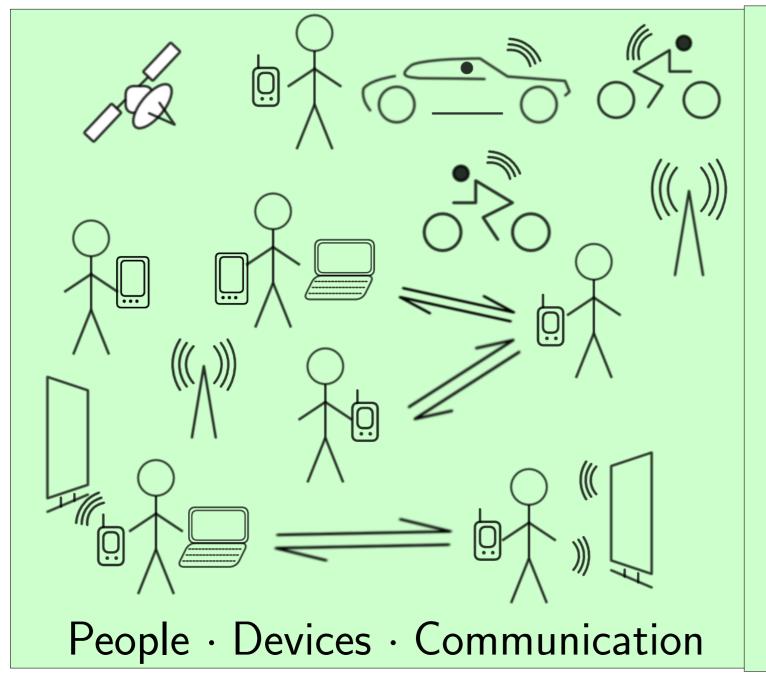
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Ambient Intelligence – or AmI – is an ubiquitous electronic environment that supports people in their daily tasks, in a proactive, but "invisible" and non-intrusive manner. [Ramos et al., 2008, Weiser, 1993]

Our Goal: Develop a multi-agent system for the application layer of an Ambient Intelligence environment.



Features of Ambient Intelligence:

- \cdot pervasive
- \cdot natural
- interactive
- \cdot flexible
- · context-aware
- proactive
- \cdot assistive
- transparent
- non-intrusive
- · privacy-aware

A Layered Perspective of Aml

Challenges

- How to make Aml reliable and dependable?
- How to manage the huge quantity of information generated by sensors and devices?
- How to provide only interesting information to the user in every situation?
- · How to make Aml privacy-aware and trustable?

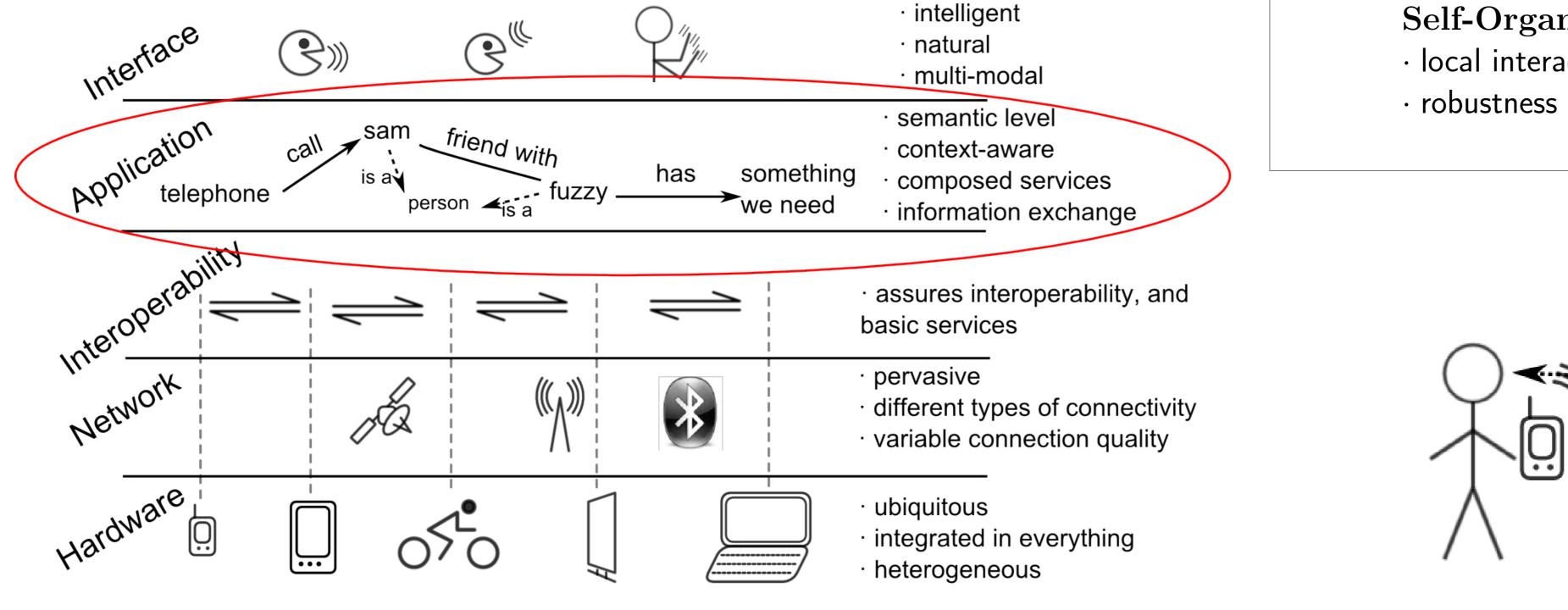
Elements of the Approach

System Distribution

- \cdot decentralization
- Multi-Agent Systems \cdot autonomy

 \cdot no vital central components

 \cdot reasoning



(layers based on [Seghrouchni, 2008])

Research Steps

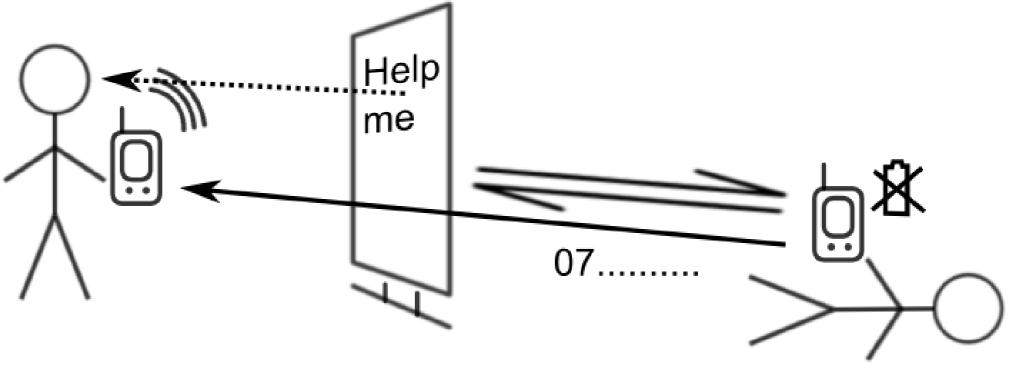
- Develop a multi-agent system based model for Aml's application layer.
- Propose scenarios that emphasize the requirements of real-scale Aml.
- Develop a simulation testbed that implements the scenarios.

- **Self-Organization**
- \cdot local interaction
- robustness & flexibility

Context-Awareness

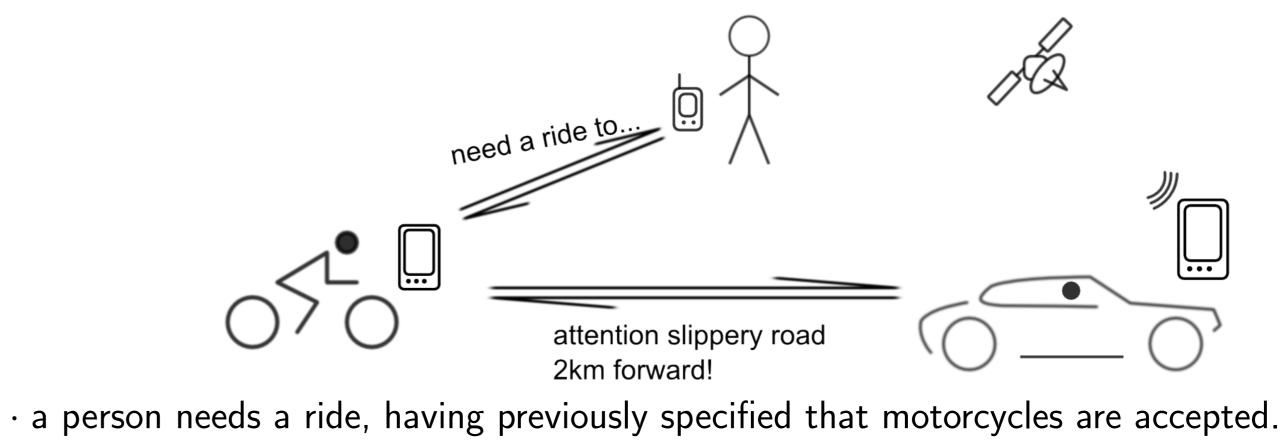
- · detection of compatible contexts
- \cdot adaptivity and anticipation





 \cdot a senior person falls on the street, in a less visible place. \cdot the smartphone detects the fall, but it cannot make a GSM call.

- \cdot it sends a short message to a nearby intelligent advertising panel.
- \cdot a person decides to help, receives the phone number and makes the call.



• Implement the developed model and experiment with the scenarios.

 \cdot the system contacts a motorcycle driver nearby that accepts the ride.

 \cdot the same system picks the information about slippery road up ahead.

 \cdot the information is conveyed to the motorcycle driver and instructs him to be careful.

[Ducatel et al., 2001, Seghrouchni, 2008]

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