



Ambient Intelligence: From Scenario Analysis towards a Bottom-Up Design

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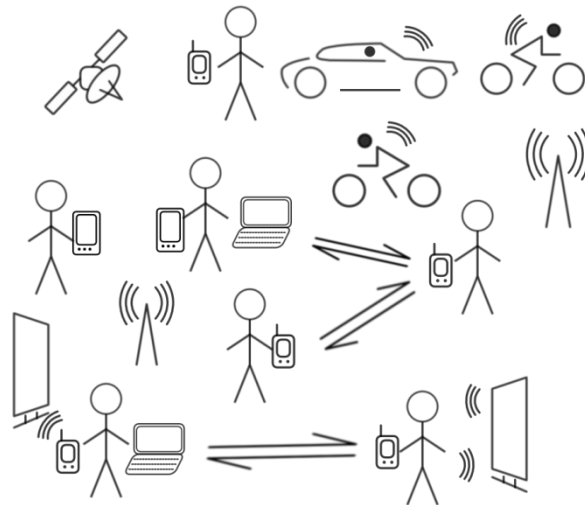
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Plan

- Introduction
 - Ambient Intelligence
 - Features of Ambient Intelligence
- Analysis of Existing Scenarios
- New Scenarios
 - Rock Concert Scenario
 - Medical Emergency Scenario
- Modeling of AmI
- Conclusion

What is Ambient Intelligence?

- A distributed, ubiquitous electronic / computational environment
- Supports people in their daily lives / activities
- Is a distributed, intelligent system





Layers of Ambient Intelligence

- Devices
 - Personal and light
 - Integrated with different capabilities
 - Offer advanced interfaces
 - Allow localization and other advanced types of sensing
- Network
 - Pervasive
 - Different types of communication
- Software
 - Different programs to be integrated
- Application / Intelligent layer
 - Moves information around in an intelligent manner
 - Delivers relevant information to users
- Interface
 - Allows gestures, speech
 - Does not need previous training

Existing scenarios & their features

- **Weiser:** Speech recognition, Ubiquitous connections, Localization, Relevant information mining
- **ISTAG:** Interoperability of resources, Application of preferences, Network connection switching, Natural interaction
- **Others:** Suggestion systems, Seamless transfer of network services and connections, Location-based services
- **Problems:**
 - From the point of view of a single agent
 - Few details about the system working in background

Essential Features

- At the application layer
 - Intelligence and robustness
 - Decentralized solution, capable of working at the local level
 - Simple, predictable, but generic and adaptive
 - Based on context-awareness and associations
 - The use of software agents as building blocks for the application layer
- Our proposal
 - 2 new scenarios
 - Building a system based on scenarios



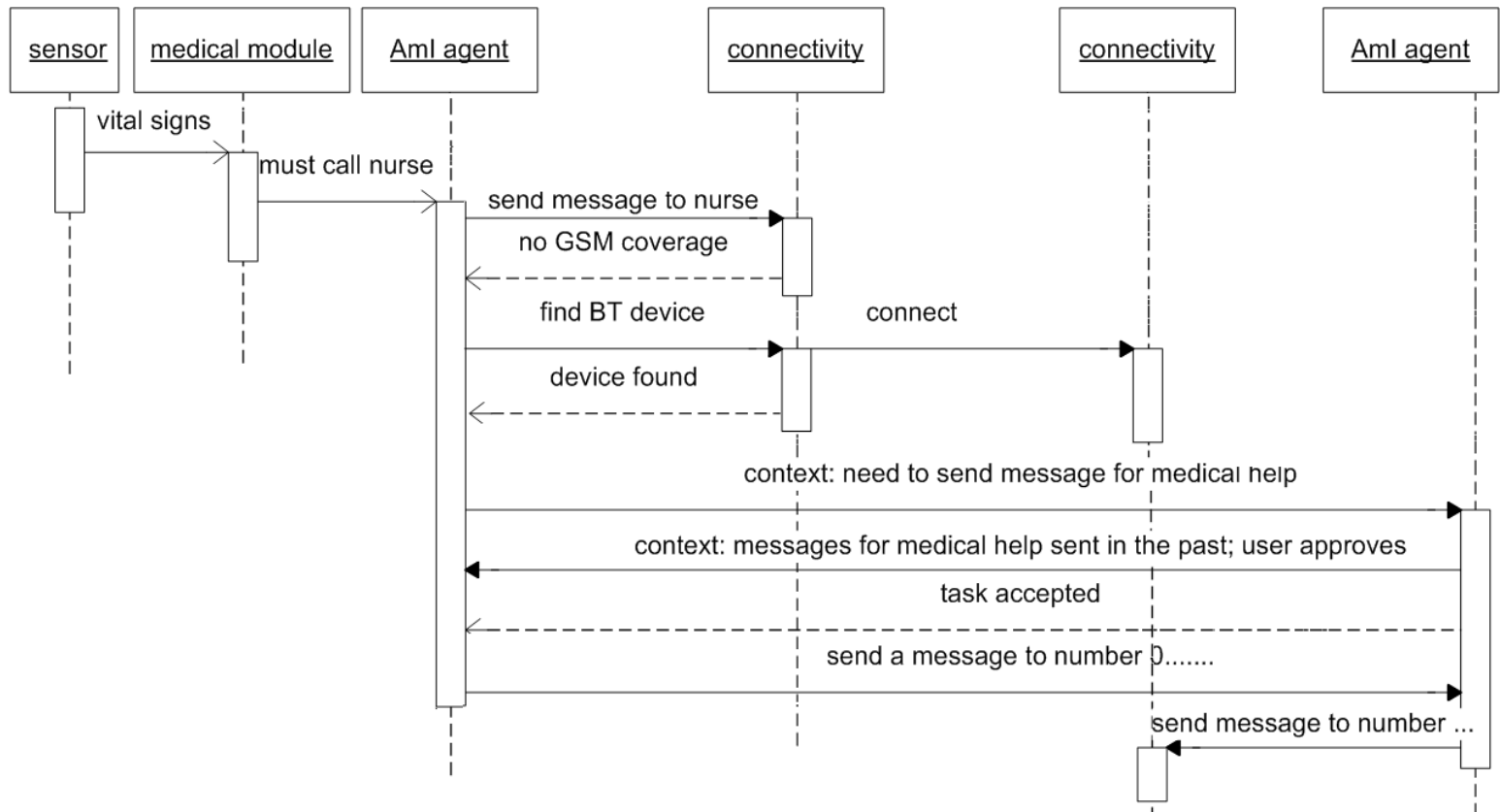
The Rock Concert Scenario

- A large number of people and devices, with reduced centralized connectivity
- Information management by device-bound software agents
- Sharing of information:
 - Locally by means of associations and compatibility of their contexts / preferences
 - Is prioritized in function of the importance of information

The Medical Assistance Scenario

- Also using agents, but the flow of information is different due to the user's preferences
- 2 agents, one for each user involved
 - Agents receive information from smart interfaces
 - Agents use communication components from the layer below
 - Decisions are taken based on compatibility of context
 - Agents only exchange the minimum of necessary information in the current context
 - All communication is done locally – no centralized services are used and all decisions are based on previous experience

Medical Assistance Scenario Agentification



Conclusion

- Scenarios supporting:
 - Context-awareness
 - Local interaction
 - Software agents as building blocks for the application layer
- Modeling a system from scenarios



THANKS