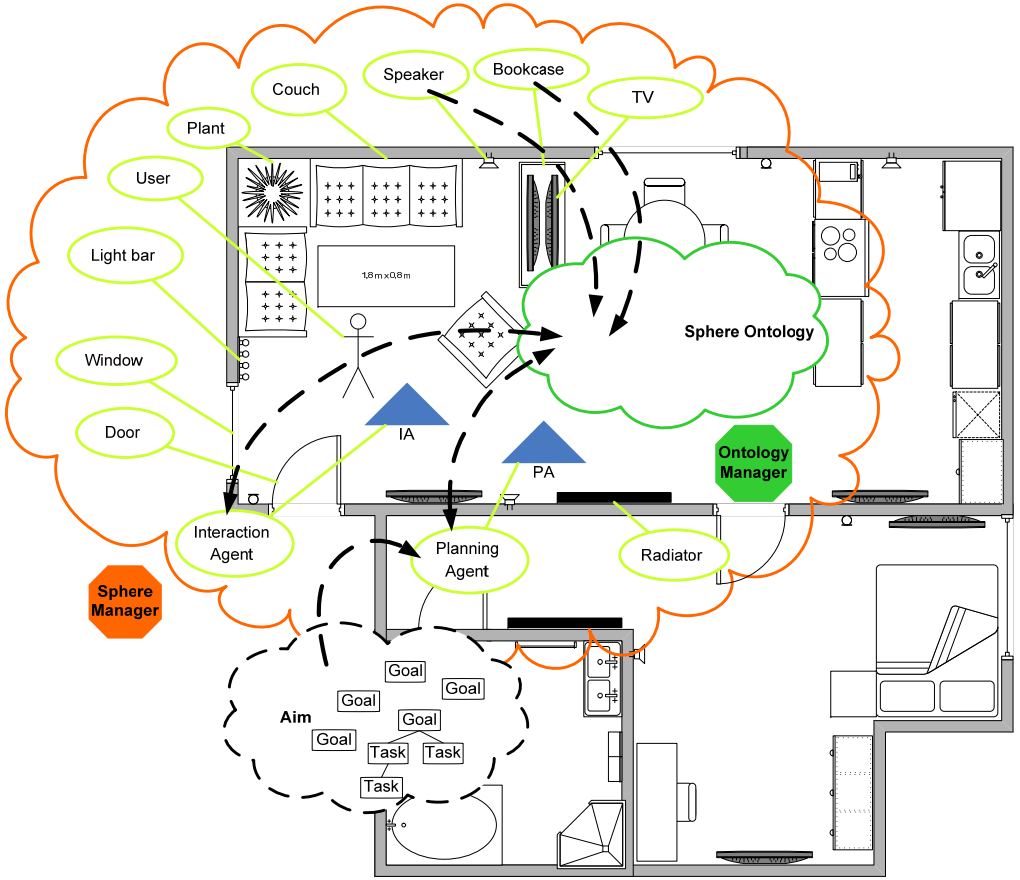
Managing Spoken Dialogues in Intelligent Environments

- Development of a speech dialogue manager (SDM) for Adaptive and TRusted Ambient eCOlogies (www.ATRACO.org)
- SDM is Part of a multi-modal Interaction Agent (IA)
- SDM runs within aim-related "Activity Sphere" (AS)
- SDM needs to handle many sources of information
  - user
  - task model (domain description)
  - devices
  - services
  - sensors



Research Questions

- Integrative speech dialogue manager
  - manages, smoothly and naturally, mixed-initiative dialogue about multiple interdependent tasks
  - solves task ambiguities and conflicts
  - allows users to interrupt, resume and order its task contributions
  - resolves all miscommunication issues

- Three main classes of dialogues
  - control: user controls various devices and services within the activity sphere
  - pro-active: activity sphere incites communication with users
  - negotiation: user completes goals and adapt them to his convenience

Methods

- Ontology-based knowledge management
  - all entities within an activity sphere support their own local ontologies to provide status, configuration, etc.
  - SDM works on set of spoken dialogue ontologies that pool all dialogue-related information within activity sphere
  - Combination of evolving ontologies is challenging
- Model-based dialogue generation
  - Enhancing recognition-rate by introducing n-step recognition
  - Allowing semantic analysis to understand the user's utterance
- User-centred evaluation
  - How do users cope with adaptive spoken dialogues (regarding multitasking)?
  - How can dialogue focus changes be handled?