Model-Driven Adaptation for 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?