Dialogue Management in the TRAINS and TRIPS Systems

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Introduction

Topics for today session:

- TRAINS project: goals, task and approach
- Dialogue management in the TRAINS systems
- TRIPS project: goals, task and approach
- Dialogue management in the TRIPS systems
- Obligations motivating conversation acts instead of shared plans

Background

- crucial role of intentions in discourse
- communication as goal-oriented action
  - crucial role of plan recognition in understanding
  - crucial role of plan construction in generation
- communication as collaborative action:
  - establishing a shared plan

The TRAINS Project

- University of Rochester, TRAINS-91 thru TRAINS-96 systems
- Domain: routing and scheduling of freight trains
- Objective: interactive planning assistant
  - NL dialogue interaction embodied in a system performing non-linguistic task requiring significant reasoning as part of collaborative problem solving
  - collaborative plan reasoning system (mized-inititative planning): goals are discussed and plans are formed incrementally as the two agents interact
- Architecture (cf. fig.)
- Demo: TRAINS-95 in action

TRAINS Dialogue Management

- maintain flow of conversation
- ensure that conversational goals are met
- based on BDI architecture for deliberative agent
  - using beliefs and desires, agent selects goals to achieve
  - for a goal, agent constructs an abstract plan to achieve it
  - based on abstract plan, agent selects and executes actions, and also creates expectations about observations
  - expectations and other knowledge are used to draw conclusions when observations are made
- modelling conversation needs in addition:
  - shared beliefs (requires grounding)
  - communicative goals
  - obligations

TRAINS Dialogue Management

- update mental and conversational state based on observed conversational acts
- deliberate on covnersational state (may lead to further updates)
- evoke reasoning and excution when appropriate

Discourse Obligations

- motivation: explain why conversants respond, even in absence of shared intentions
- encode conversation conventions as obligation rules
- addressing an obligation results in a conversational act intention
- discourse actor algorithm incorporating obligations

TRIPS Project

- University of Rochester, follow up pf TRAINS
- TRAINS vs. TRIPS
- Architecture (cf. fig.)
- Demo