

A Smart Shopping Assistant utilising Adaptive Plan Recognition

Michael Schneider, Universität des Saarlandes

8. Oktober 2003

Overview

- Smart Shopping Assistant
- System Architecture
- (Adaptive) Plan Recognition
- OPRES: Object-Oriented Plan Recognition
- Hardware Setup
- Demonstration

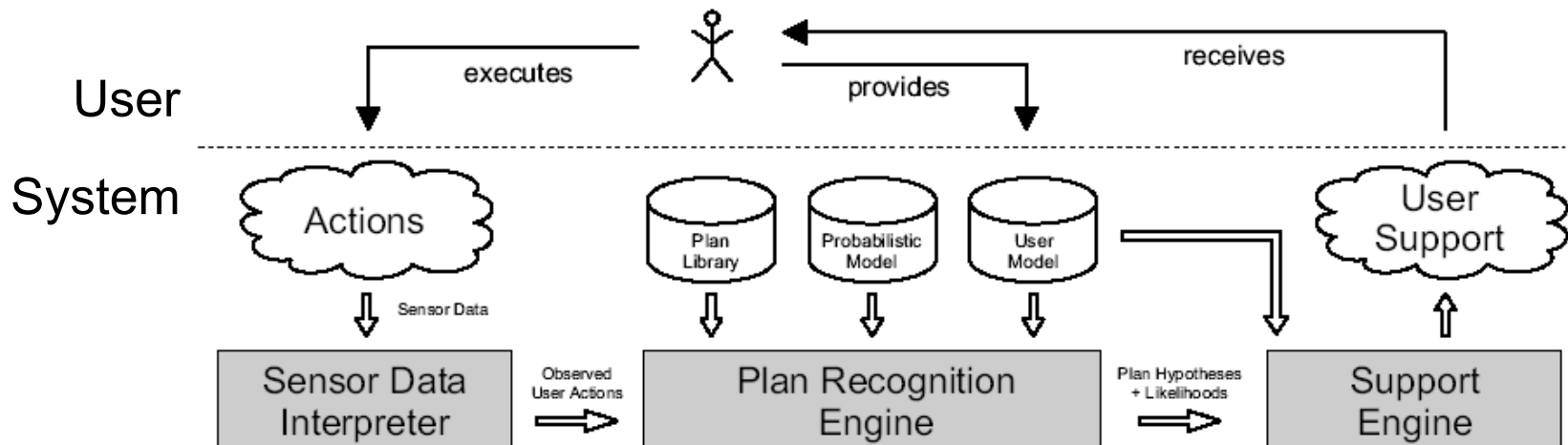
Smart Shopping Assistant (Motivation)

- Personal
 - Ubiquitous and transparent tool
- Mobile
 - Does not inhibit fun of strolling around
- Adaptive
 - Adapts to user's preferences and experiences
 - Adapts to current context

Smart Shopping Assistant (Shopping Cart)



System Architecture



Plan Recognition

- Shopping Assistant needs knowledge about
 - what the user wants/needs (Goals)
 - what the user is going to do (Plans)
- Plan Recognition
 - Observing the user's actions
 - Linking observations to goals and plans

Adaptive Plan Recognition

- Relations between actions and goals/plans depend on
 - User's knowledge
 - User's preferences
 - Other related context
- } user model
- Plan recognition systems must explicitly take into account these factors !!

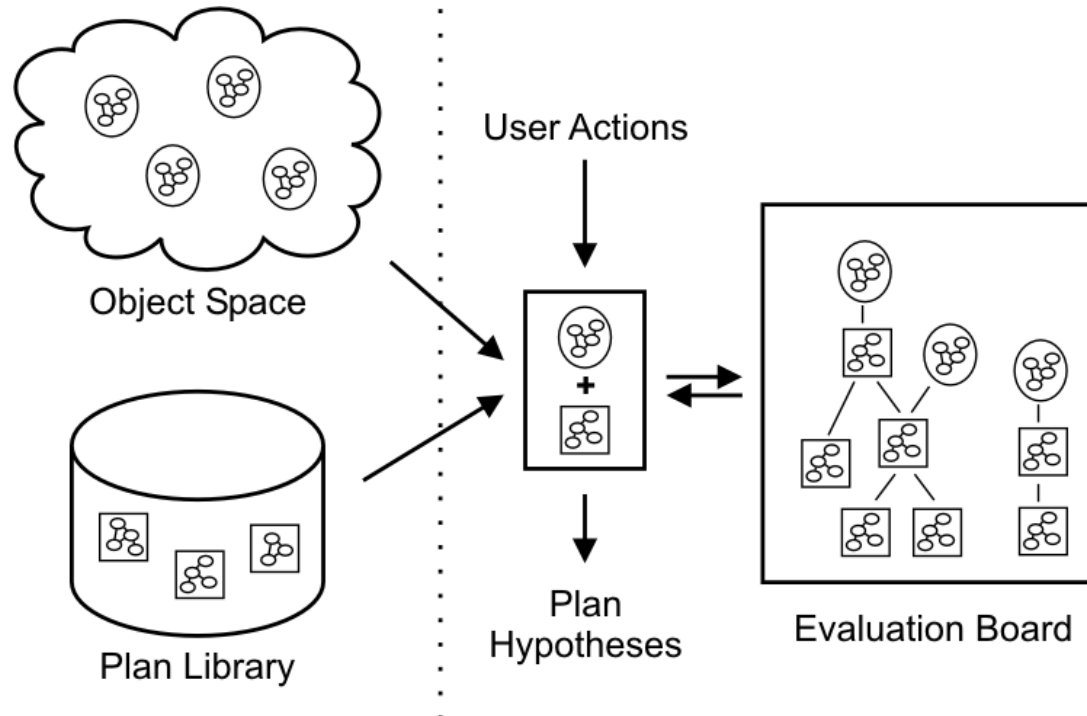
Characteristics & Requirements

- Uncertain knowledge and sensor data
 - Use probabilistic approach
- Concrete user and context model unknown at design time
 - Modular knowledge representation
 - Link at runtime

Object-Oriented Plan Recognition

- Specify user and context model as PRM (probabilistic relational model) classes
- Construct probabilistic model of inferred plan hypotheses at runtime by instantiation
- Calculate likelihood of certain plan hypotheses by evaluating the constructed model

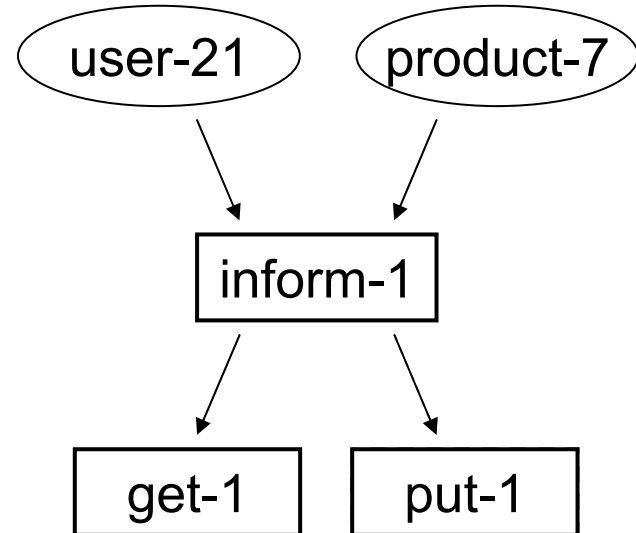
OPRES (Object-Oriented Plan Recognition System)



Example Hypothesis Construction

Steps:

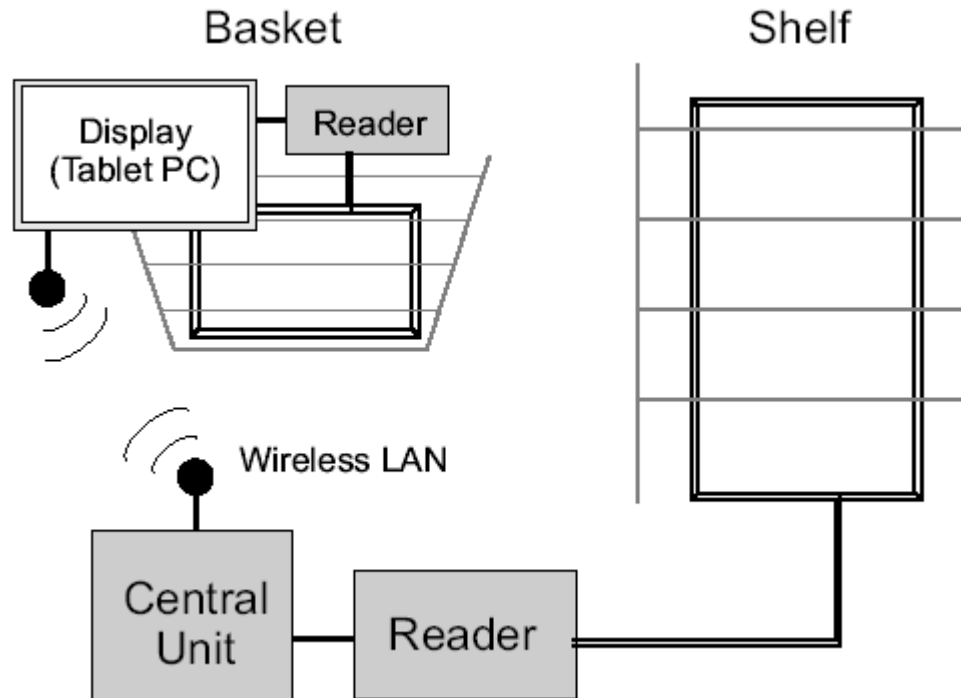
1. Observe user's action and current context
2. Search plan library for explanations
3. Link new observations to existing explanations



Hardware Setup

- RFID (Radio Frequency Identification) technology is used to observe user actions
- All products are tagged with transponders
- Shelves and shopping basket are equipped with antennas and readers
- Interpret flow of objects between shelves and basket as manifestation of user actions

Hardware Setup (2)



Demonstration



The End

Michael Schneider
mschneid@cs.uni-sb.de

Universität des Saarlandes