This is your bus, please BOARD NOW

MAPS

(Memory Aiding Prompting System)

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CLever: Building Cognitive Levers
to help people help themselves

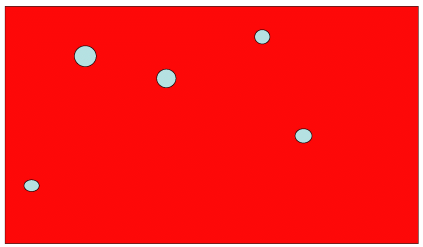
Center for LifeLong Learning & Design
University of Colorado at Boulder

Stuff coming out of today's discussions

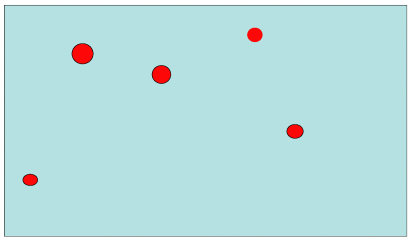
- Ethnography. Participant observation.
- Scenarios in design process.
- Expertise in doing psychological experiments needed by us as technologists.
- Emphasise caregiver's role (in system design and editor use) (MetaDesign)
- No more renaissance men – community of interest
- Important to be clear with testers whose lives you will change that this is a test……

Young adults with cognitive disabilities

Islands of abilities in seas of deficits:
Unexpected abilities that can be leveraged



Islands of deficits in seas of abilities:
causes of unexpected activity failures



- Caregivers intimate knowledge
- Variations in ability

Challenge -

- Cognitively disabled individuals are often unable to live on their own because of deficiencies in memory, attention, and executive functionalities.
- Computationally enhanced prompting systems can provide a bridge to independence.
    - Prompting system: segments, representation, collapse-expand
- Unacceptably high abandonment rate (50% - 70%) of expensive (~. 5-4 K$) Assistive Technology (AT)
    - difficult (re) configuration leads to abandonment

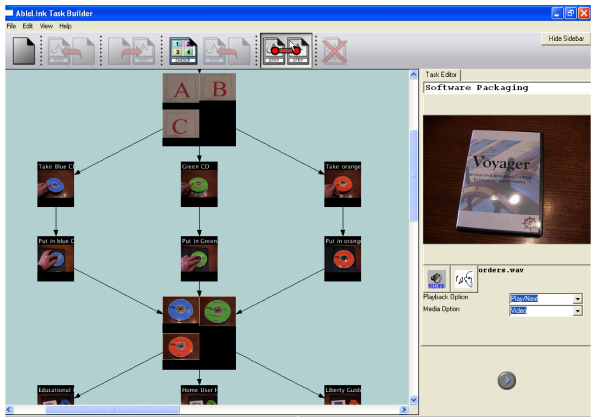
Existing Prompting Systems

- Manual Prompting
  - Effective for learning, not useable as prosthesis
- Visions
  - PC based
  - Difficult to (re)configure
- Ablelink (visual assistant)
  - PDA based
  - static scripts only

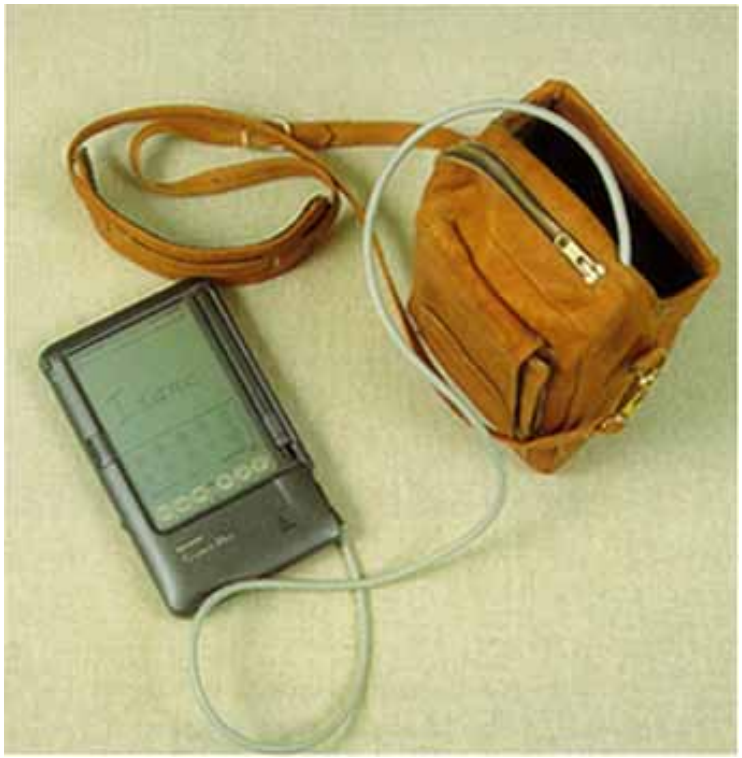
Environment Home
Activity Making a Sandwich
Student _____ **Please note kind of sandwich**

1-Independent
2-Model
3-Indirect Verbal
4-Gestural

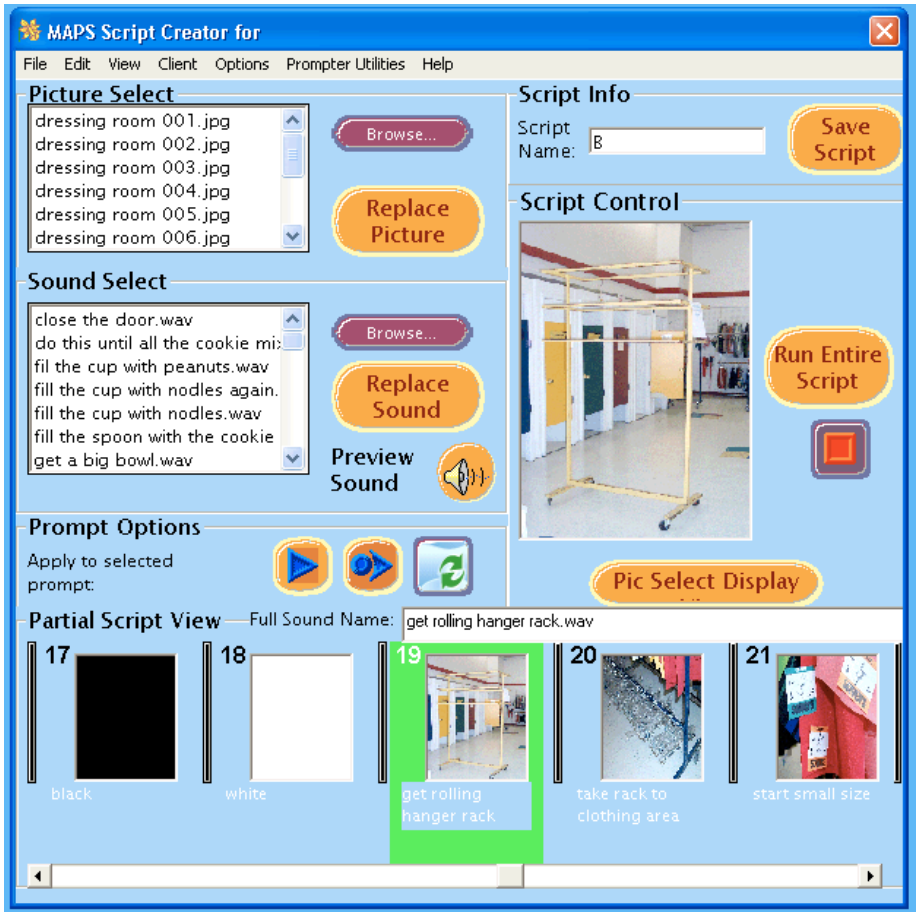
	A	B	C	D	E	F
1		Modifications				
2	Gets bread package					
3	Opens bread package					
4	Takes out two slices					
5	Closes bread package					
6	Opens jar					
7	Gets knife					

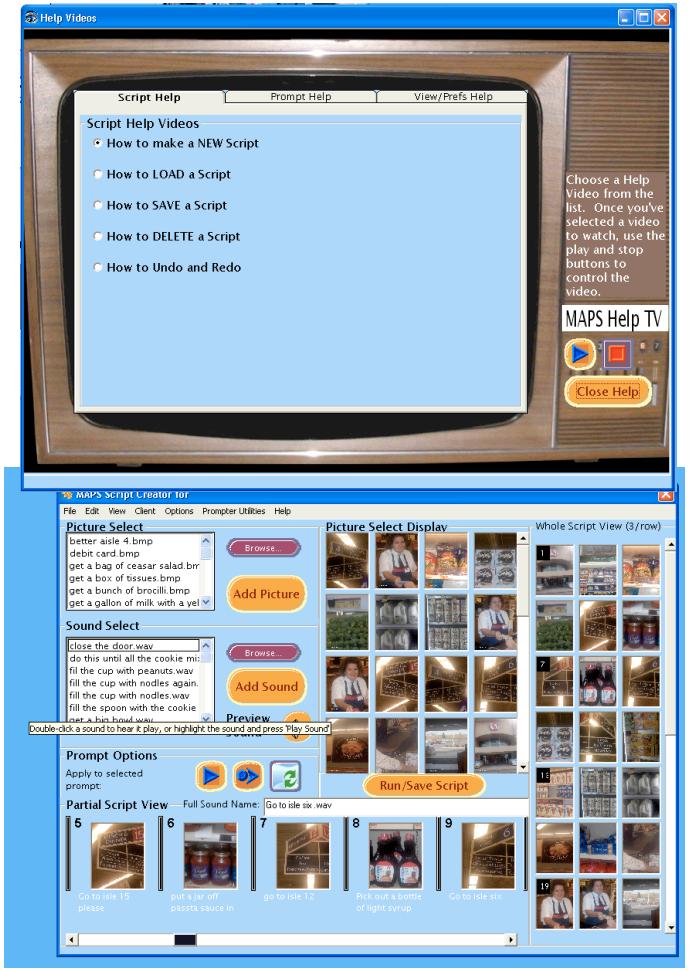


Isaac, the Grandfather of computationally based Task Support Systems



Script Design Environment (Editor)





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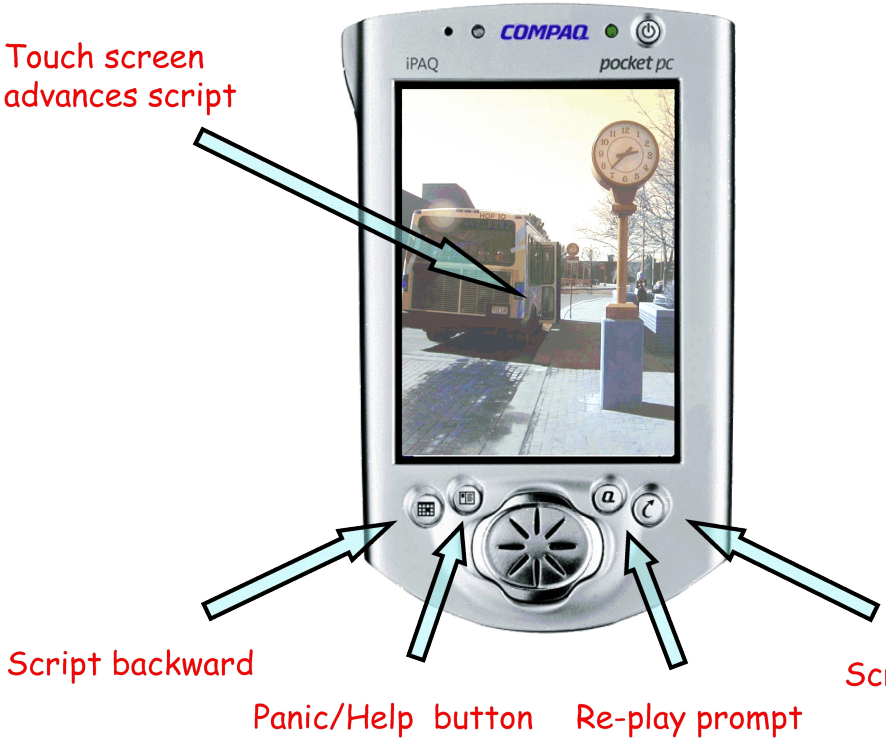
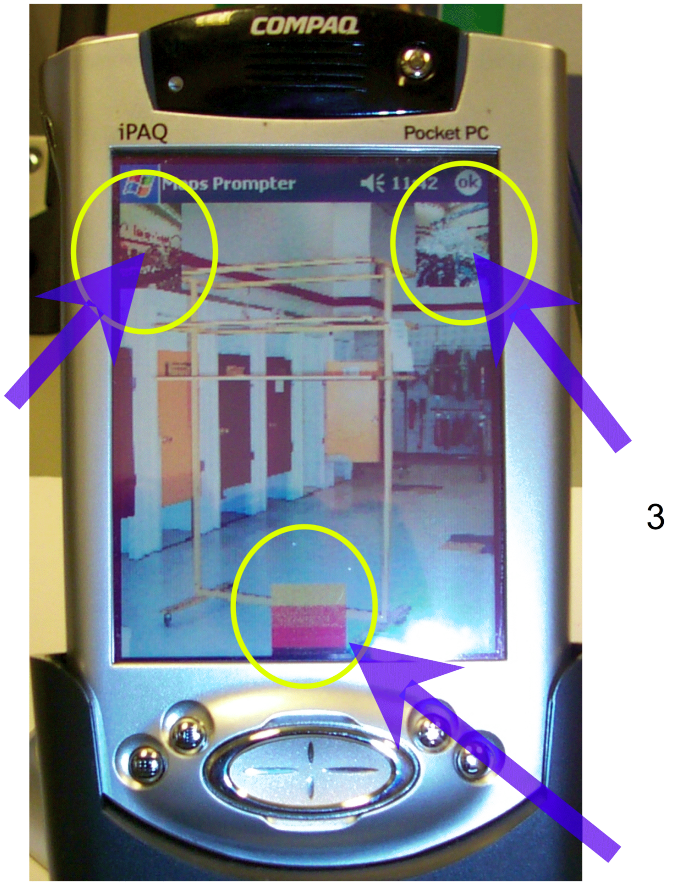
Prompter


Touch screen
advances script
COMPAQ
iPAQ
pocket pc
Script backward
Panic/Help button
Re-play prompt
Script forward


COMPAQ
iPAQ
Pocket PC
2
3
1

MAPS users

Editor Design Process and Details

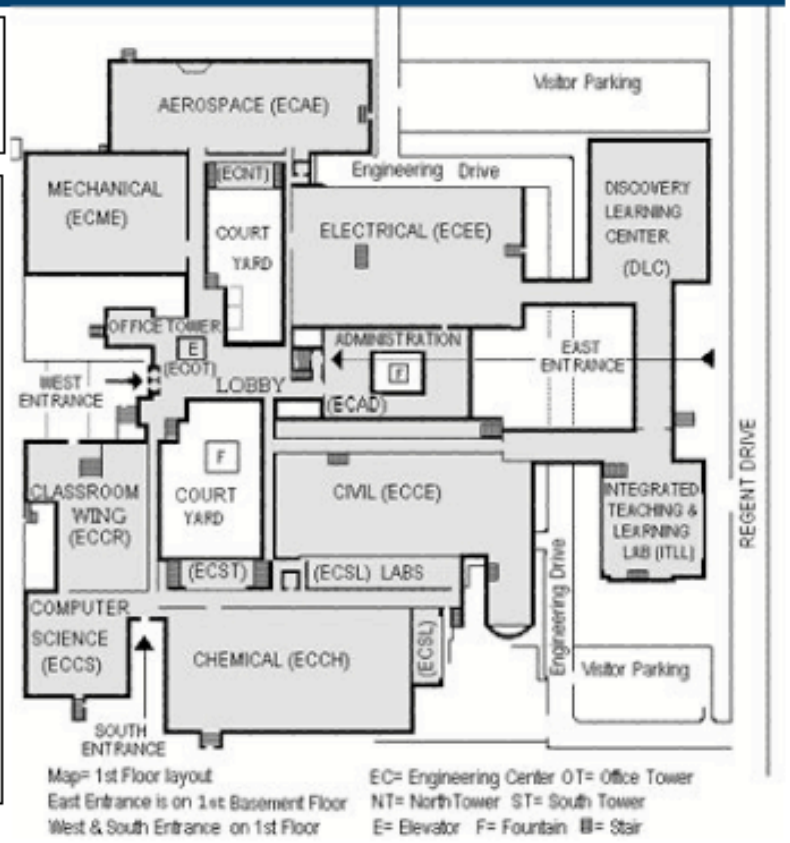
- Usability testing
  - Three passes with 8 participants total
- Innovative aspects
  - Persistence / reuse / templates
  - Video help
  - Multiple script/prompt views

MAPS as a Platform for ADS……

Lifeline: Amy Martin

Script Name: "MANTIS"
Started: Mon Jun 26 10:18:23 GMT-0600 2006
ERROR: Time Limit Exceeded!

Step Name	Started	Time
"Mantis guide from engineering to L3D.wav"	Mon Jun 26 10:18:24	20
"Turn around and walk to end of hall.wav"	Mon Jun 26 10:18:29	16
"Turn right here.wav"	Mon Jun 26 10:18:34	17
"Proceed to the sign.wav"	———	—
"Turn left here.wav"	———	—
"Go down the hall to the ITL.wav"	———	—
"Walk down ITL hall to end.wav"	———	—
"Turn left here.wav"	———	—
"Go down ITL to end of hall.wav"	———	—
"You are in the DLC.wav"	———	—
"Make immediate right and immediate left.wav"	———	—
"You have arrived at the L3D lab.wav"	———	—



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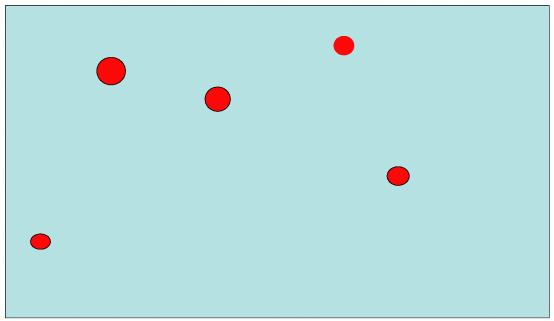
Field Trial Success & Failure

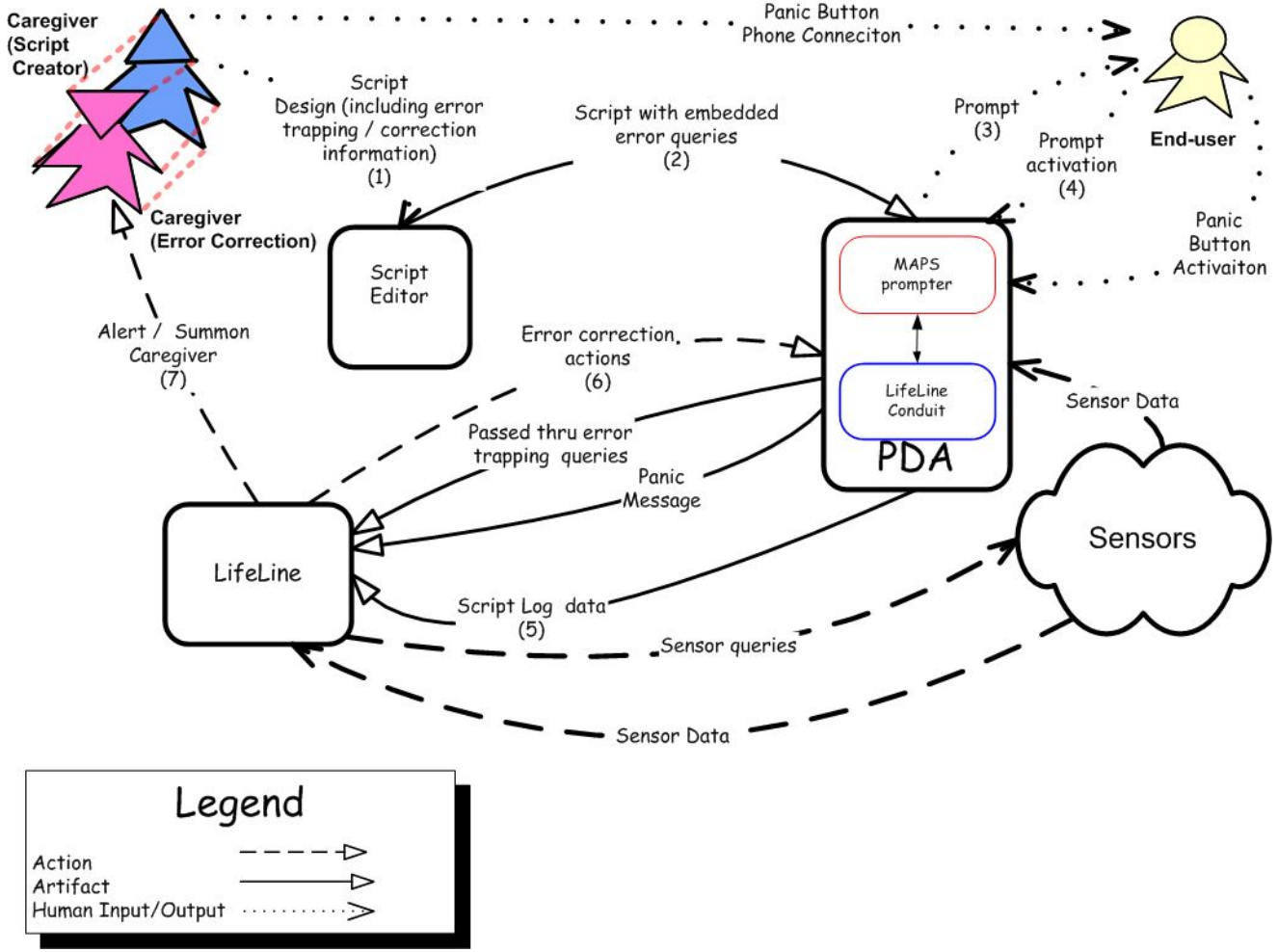
- Success
  - Shopping
  - Laundry
  - Savers (multiscript)
  - Folding (islands)

Islands of deficits in seas of abilities:
causes of unexpected activity failures



- Failures
  - Cooking (over estimated internal scripts)
  - Library (under estimated internal scripts)

Conceptual Design



Information ecology supporting caregivers and users with cognitive disabilities

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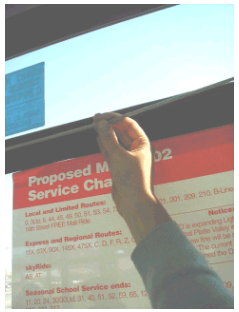
MAPS – Error Detection & Correction



Missed
Bus Stop !

Tom
(more cognitive
resources)

Alert
Caregiver

Tell the
Bus driver
your problem

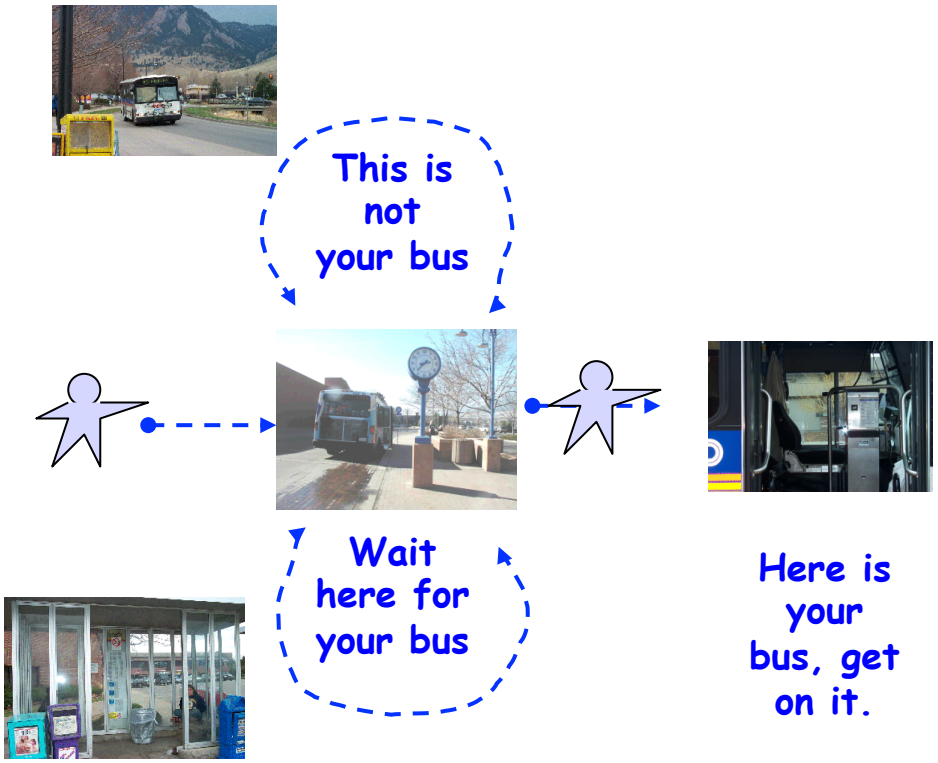
Summon
Caregiver

Anne
(less cognitive
resources)

Wait on bus
for
Caregiver

- Template based dynamic error detection & correction
- Lifeline monitors the running script, detects error states & contacts caregiver as needed

MAPS – Context Awareness and Dynamic Prompting



- Dynamic prompt generation
- Blocking for event driven prompt

Thanks

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