ASSESSMENTVILLE – A PREVIEW

Ehud Sharlin[1], Benjamin Watson[2], Lili Liu[1], Steve Sutphen[1], Robert Lederer[1], Pablo Figueroa[1] and John Frazer[3]
1. University of Alberta; 2. Northwestern University; 3. The Hong Kong Polytechnic University

Tangible User Interfaces (TUIs):

- *Interface devices that use physical objects as means of inputting shape, space and structure into the virtual domain.*

Our challenge:

- Explore valuable applications for current TUIs.

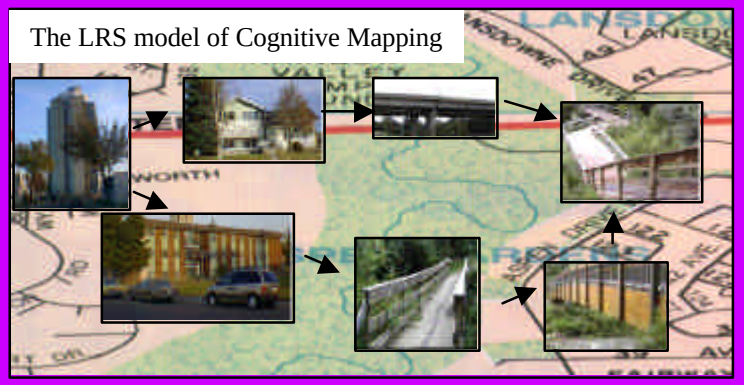
The problem:

- Assessing Alzheimer Disease (AD) in its early phases.
- Early phases of AD affect a crucial life skill, finding your way around.
- The decline in functional wayfinding is caused by the decline in cognitive mapping abilities: the ability to create a mental representation of space.
- Early AD affects the higher level of cognitive mapping – the ability to create survey knowledge – a detailed synergy of landmarks and routes to a map-like representation.

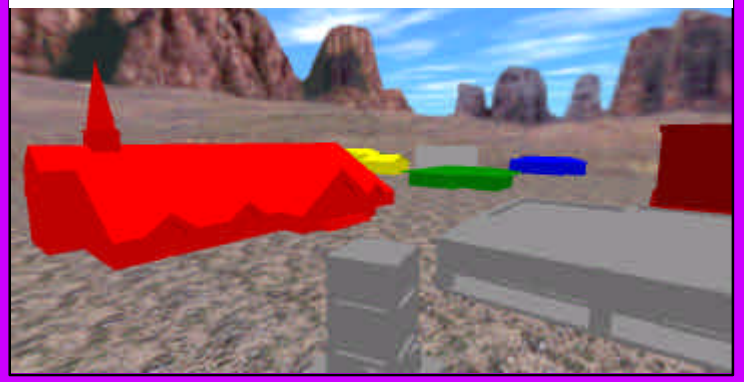
Suggested solution:

- Cognitive Map Probe (CMP) – automatic assessment of AD in its early phases by automatically measuring the user's cognitive mapping abilities.
- The CMP employs Assessmentville – a TUI based neighborhood environment. The user explores a virtual environment and then reconstructs it physically. The virtual interface consists of highly realistic virtual 3D urban models. The physical interface consists of the precise physical counterparts (3D print-out) of the virtual models.
- The CMP's usage of identical physical and virtual entities affords simple mapping between the virtual and physical element, making it valuable for elderly users.

The LRS model of Cognitive Mapping



Cognitive mapping of a new environment by virtual exploration



Probing the user's cognitive map with Assessmentville

Cognitive Mapping:
The LRS (Landmark, Routes, Survey) model.
Survey Knowledge:
A detailed synergy of landmarks and routes to a map-like representation.

The Cognitive Map Probe

Virtual Exploration and familiarization
The user cognitively maps a new environment.

Physical Querying – using Assessmentville.
The system probes the accuracy of the user's cognitive map.

Virtual Feedback