

The Tangible Pathfinder

Design of a Wayfinding Trainer for the Visually Impaired

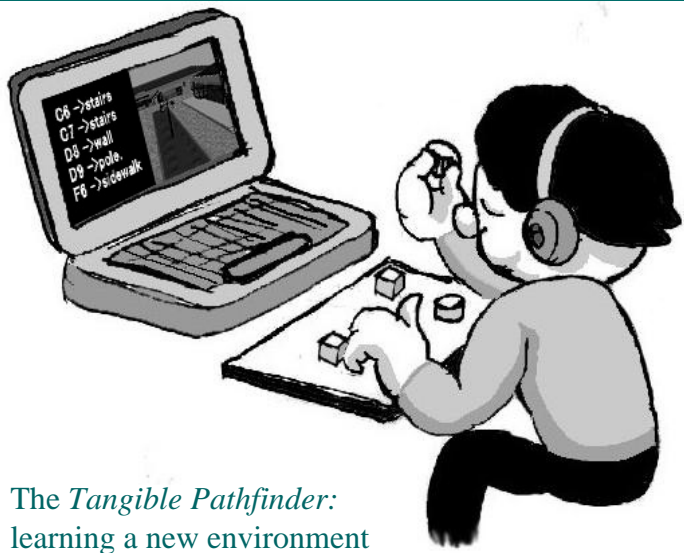
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The *Tangible Pathfinder* design goals:

- Autonomous learning of a new place,
- Self-assessment of the resulting cognitive map.
- On-site mobility assistance when physically walking through the environment.



The *Tangible Pathfinder*:
learning a new environment



Mobility assistance
in a new place

Tangible user interfaces (TUIs): physical objects that mediate interaction with shape, space and structure in the virtual domain, affording intuitive, tactile embodiment of digital entities. TUIs could have an important role in various future HCI paradigm for the visually impaired.

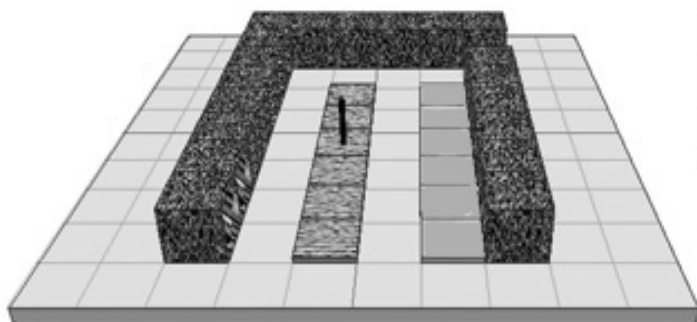
The *Tangible Pathfinder*: a tablet-like TUI, tracking a set of physical objects placed on its surface, and spatially-related 3D auditory cues.

Detachable physical set of objects: a “cane-vision” tactile vocabulary, based on a set of miniature representations designed from the point-of-view of a vision-impaired person walking with a cane. Objects represent common landmarks for a cane-walker, such as pavement, sidewalks, curbs, ramps, walls and poles.

Wayfinding training activities with the *Tangible Pathfinder*:

1. Tactile sensing and feedback: using the *Tangible Pathfinder* as a static tactile map, gaining information about objects and route layouts by touch.
2. Tactile browsing and audio feedback: moving a tracked physical avatar on top of the TUI while receiving detailed 3D audio feedback.
3. Tactile rearrangement and audio feedback: attempting to reconstruct an environment with tactile and 3D audio feedback relating to actions correctness.

The user can independently upload environments from an online database, gradually copying a set of coordinates and object identities onto the *Tangible Pathfinder*.



Interactive, tactile, editable, “cane-vision”
representation of the environment, in small-scale

