

Mobility for All: Community Access through Intelligent Mass Transportation Systems

Overview: The goal of the Mobility for All project is to lower barriers to community access and mobility for persons with cognitive disabilities. Since operating an automobile is not a viable transportation option, we are designing frameworks and technologies to make complex mass transportation systems more accessible for those with cognitive disabilities who are capable of working or living independently.

Contact Information:

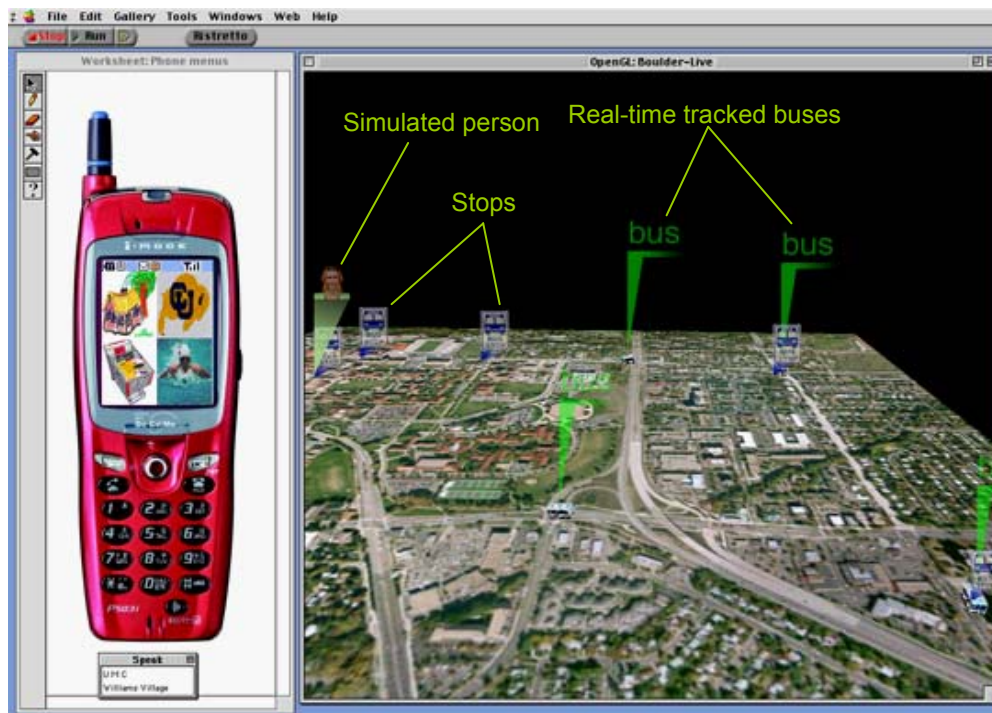
Gerhard Fischer..... gerhard@cs.colorado.edu
Jim Sullivan..... sullivan@cs.colorado.edu
Website:www.cs.colorado.edu/~l3d/clever/projects/mobility.html
L3D Center.....www.cs.colorado.edu/~l3d

Mobility for All is a Cognitive Levers research project of the Center for LifeLong Learning and Design (L3D) supported by the Coleman Initiative.

Status: Our team surveyed transportation systems in six major US cities. We have analyzed the *cognitive activities* patrons engage in as they *plan, navigate, move* and *learn* to use these complex systems and have identified *essential navigation artifacts* including *maps, schedules, signs, labels, landmarks, and clocks*. We have also studied young adults with cognitive disabilities learning to navigate with these artifacts on public transit systems. The cognitive challenges associated with learning and using public transportation systems are significant for any new user, and are particularly daunting for users with cognitive disabilities. These challenges also presents tremendous *opportunities* for designing new assistive technologies and navigation approaches that benefit *both* the cognitively disabled *and* general public.

To address these challenges, we have designed a socio-technical architecture and technical prototype that leverages existing Global Positioning System technologies now appearing in major US cities to manage bus fleets. Our proposed architecture and prototype systems will:

- Provide mobile, contextualized, personalized "just in time" prompts in multiple modes (visual, auditory, or tactile).
- Reduce cognitive loads by focusing memory and attention on critical tasks including which bus to board, when to get off, and where to go next, much like caregivers do as they train new users.
- When necessary, communicate special user needs (e.g. a destination or needed connections; physical access needs; etc.) to system operators using encrypted wireless or smart tag technologies so bus system operators can provide assistance.
- Allow caregivers or family members to monitor trip progress and offer assistance - while maintaining privacy.



To develop and refine our architecture and technical prototypes, we have formed a unique consortia of university researchers, assistive care specialists and caregivers, urban designers, transportation planners, and commercial technology companies. Our Mobility For All prototype was co-developed with AgentSheets Inc. (www.agentsheets.com) and synchronizes agent-mediated prompts with real-time bus data from mobile GPS equipment installed on University of Colorado and Boulder city buses by Intuicom Inc. (www.intuicom.com).

Mobility for All prototype mobile prompting device and caregiver display