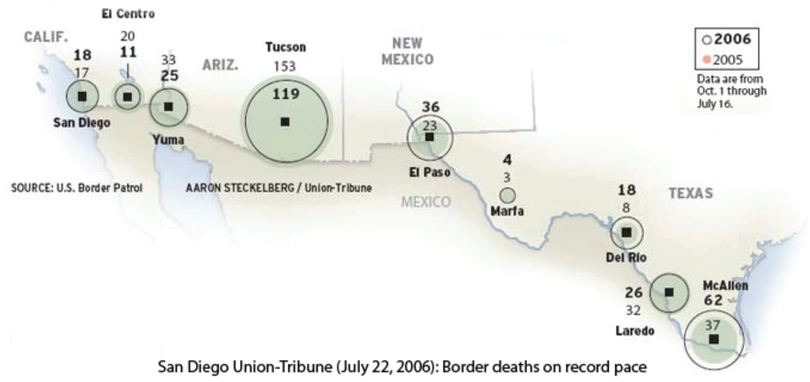
Transborder Immigrant Tool Project

JASON NAJARRO, Cognitive Science, UCSD RICARDO DOMINGUEZ, Visual Arts, UCSD BRETT STALBAUM, ICAM MICHA CARDENAS, Visual Arts, UCSD

Background

Each year, thousands of people attempt to traverse the unforgiving desert terrain that makes up the United States-Mexico border. Hundreds of those migrants lose their lives to the elements due to the inability to discern where they are in relation to where they have been and which direction they need to go.

Migrant Deaths Along U.S.-Mexico Border



San Diego Union-Tribune (July 22, 2006): Border deaths on record pace

Objective

The goal of the project is to help reduce the number of deaths along the border by developing a common cell phone device into a navigation tool that will help migrants locate life saving resources in the desert such as water caches and safety beacons.

Motorola i455

> GPS Enabled
> Inexpensive ($40)
> Supports J2ME Applications
> No service required for GPS functionality

Research

Understanding the Context of Usage

In order to save lives, the tool must prove operable in hands of users who are inexperienced with mobile devices, in the context of extreme weather conditions and a tense social environment. Significant time was spent researching the context of usage to help guide the design for a cell phone software application. Here is some of what was learned:

> The non-literacy rate among migrant population is high.
> Not all speak Spanish but also various indigenous languages.
> Device most likely to be used at night.
> Humanitarian groups want to keep their water stations protected.
> Border patrol will arrest those who they suspect of being guides

Design Inspiration

"Dowsing, or water witching, refers to practices which some people claim enables them to detect hidden water, metals, or other objects, usually obstructed by land. The movement or vibrations of the apparatus, such as a Y-shaped twig, are used in the practice."

Dowsing, http://en.wikipedia.org/w/index.php?title=Dowsing&oldid=155844709 (last visited Sep. 10, 2007).

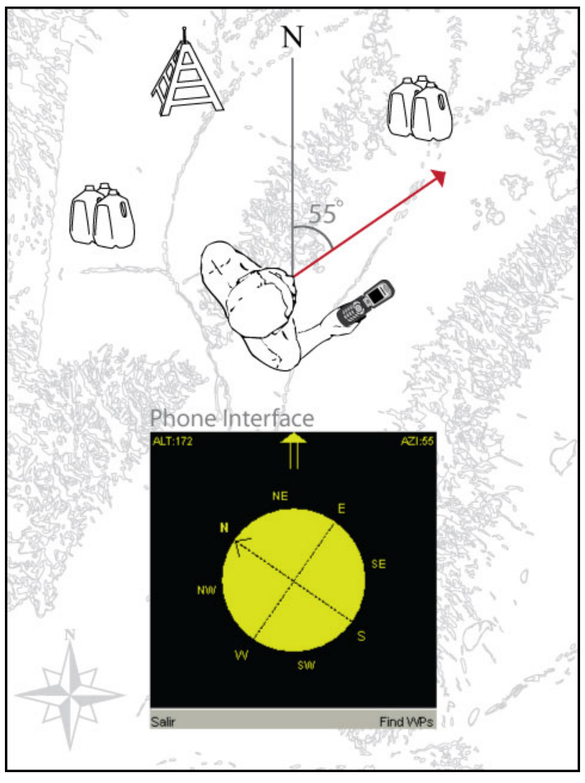
Design Advantages

> Provides user with greater situational awareness.
> Dowsing paradigm better maps to users' preconceived notions of how GPS technology functions.
> Depth of menu navigation is reduced, a major benefit for non-literate users.
> While traveling, tactile feedback frees user from phone display interface, allowing user to concentrate on the surrounding environment.

Results

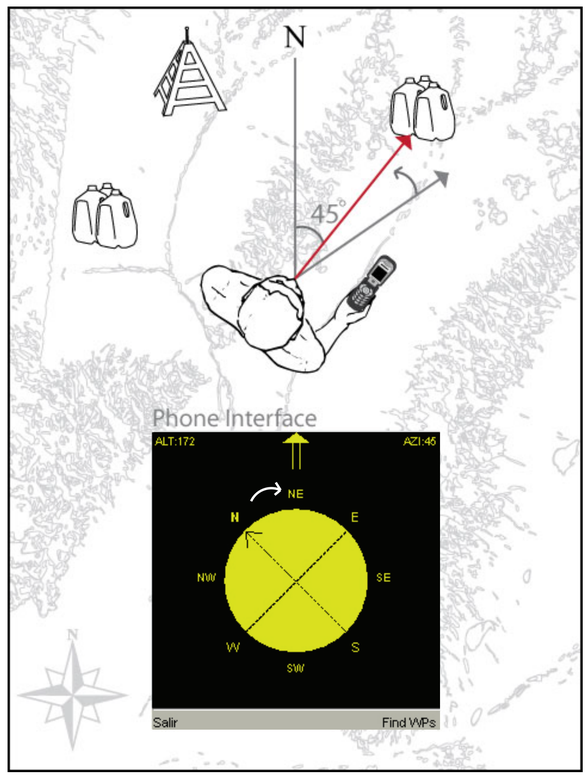
A beta version of the Transborder Immigrant Tool was programmed on the J2ME platform and deployed on a Motorola i455 cell phone. Below is a demo of the tool's main operation.

1. Normal Navigation



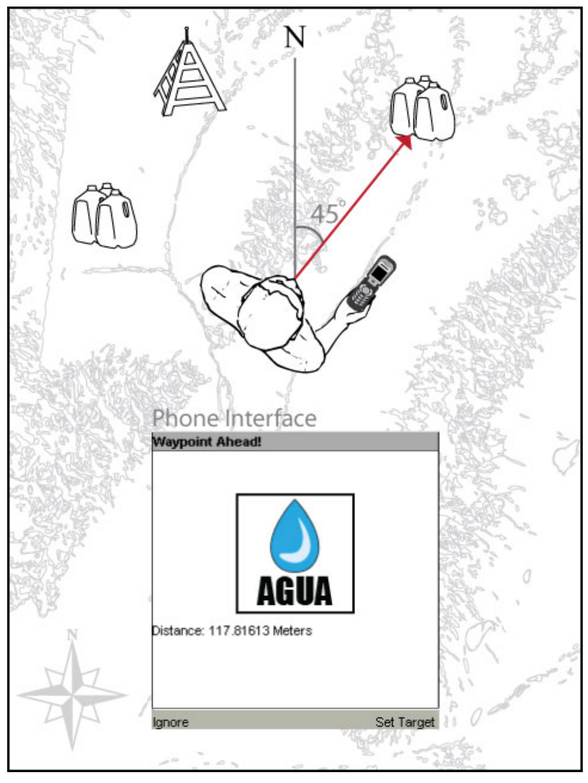
While walking with the device in hand, the mobile interface represents a traditional compass interface

2. Course Alteration



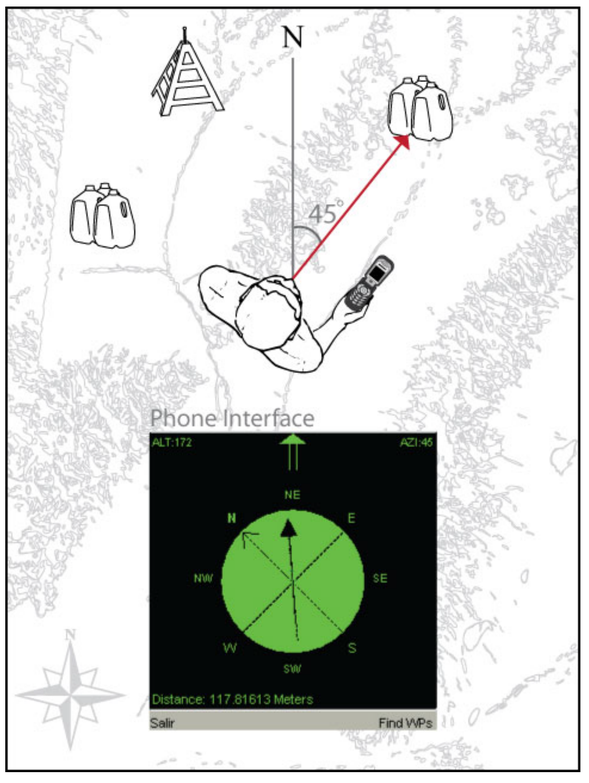
If the user changes his or her direction of travel, the compass face will adjust to represent the user's new course.

3. Waypoint Detection



When the direction of travel is equal to angle between true north and the position of some life-saving resource, an alert will appear with information pertaining to the resource ahead.

4. Target Destination Set



When the user chooses to search for a resource, an arrow on the compass face will always guide the user to the destination even when the user changes his or her course.