



# Fraunhofer

## PORTUGAL



Fig1. Alz Nav's main menu (left) and quick contacts list (right)

## ALZ NAV

### MONITORING AND NAVIGATING OLDER ADULTS AND PERSONS WITH DEMENTIA

Alz Nav is a monitoring and navigational application designed for older adults and persons with dementia. It increases their autonomy by increasing their sense of safety when going outdoors and also eases the caregivers' concerns by reassuring them that they will be alerted if their cared-for's get lost and need help.

#### Context

The increase of the average life expectancy leads to the creation of an older society and, therefore, to an increase of age-related impairments like dementia. Older adults' time and spatial orientation are already often disrupted, even if momentarily, but this becomes particularly noticeable if they suffer from any type of dementia. These factors lead to a significant decrease in these persons' navigation skills – the skills a person needs to find their way to a specific location –

which are fundamental for community access, personal independence and community integration. These limitations make these people feel less secure when going out on their own, making them more dependent on their caregivers. Further, one of the most concerning symptoms of the most common form of dementia, Alzheimer's Disease, is a wandering behaviour in which patients wander past their caregiver's supervision and begin an aimless and disoriented walk. Such behavior increases the possibility of accidents and can become extremely dangerous if undetected. The increase of age-related conditions will also lead to new demands for health and social care services. The focus of many nations' strategies to address these concerns relies on the use of technology in order to enable this senior population to live autonomously, for as long as possible.

#### Contact

Rua Alfredo Allen 455  
4200-135 Porto, Portugal

Phone +351 220 408 300  
Fax +351 226 005 029  
info@fraunhofer.pt  
www.fraunhofer.pt

## Project Details

February - July 2011

MSc Thesis Project

## Features

Keeps track of the user's location

Facilitates the process of calling for help

Autonomously assesses if the user is straying from a safe location and acts accordingly

Navigates the user back to a safe location, if he wishes to

Informs caregivers of the user's situation and location, when necessary

Allows caregivers to request and receive information regarding their cared-for's whereabouts

## Requirements

This system is available for Android 2.2 and over. It requires a device equipped with GPS and a data connection in order to use the navigation functionality

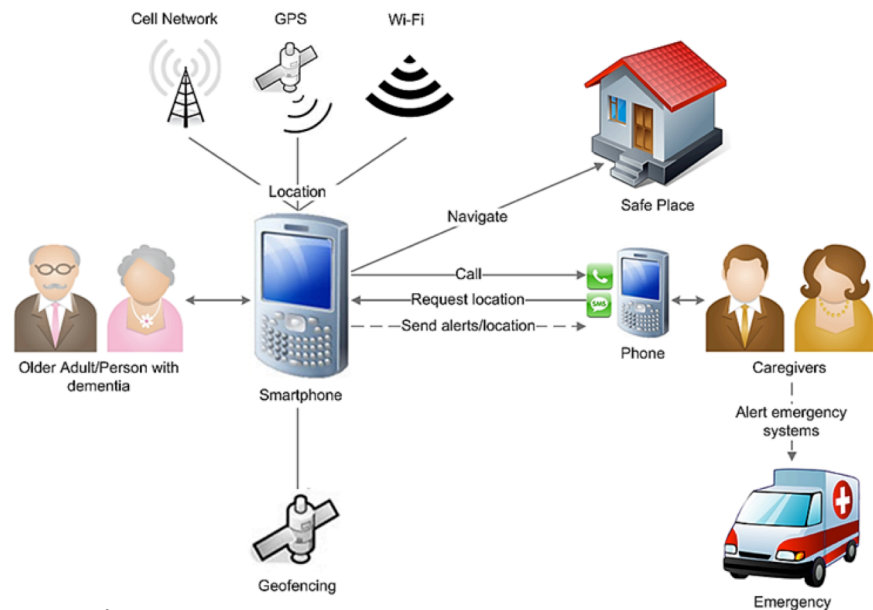


Fig2. System overview

## Monitoring and Alerts

In order to keep the user safe, Alz Nav monitors its location in the background. If the user leaves a predetermined safe zone, its caregiver is alerted by SMS and the user is given the possibility to be guided back home or call for help. Using an algorithm that manages the location monitoring frequency according to the user's proximity to its safe zone borders, the application maximizes battery life.

## Calling for Help

Alz Nav enables users to perform one click calls to caregivers when necessary, and presents them with a simplified interface for calling important contacts (previously defined by the caregiver).

## Remote Requests

Caregivers can remotely request information regarding their cared-for's whereabouts. These requests will be processed and answered autonomously.

## Navigation

Using audio instructions as the main navigational method, Alz Nav guides its user back to a safe place when needed. A visual interface designed according to the target user's needs and limitations was

developed, combining textual information that can be read out loud, with visual guidance instructions. Positive reinforcement messages were included in-between decision points, increasing feedback and reassurance to the user. An arrow that constantly points to the next waypoint, independently of the device's orientation, simplifies the navigational process, while also solving previous systems' issues regarding the initial orientation of the user.

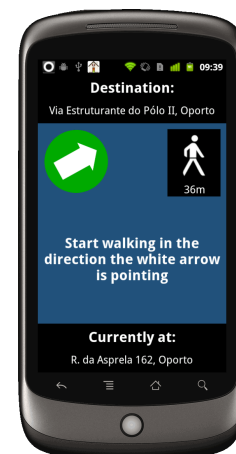


Fig3. First navigational instruction

## Future Work

Alz Nav's functionalities could be extended to monitor other alarming situations, such as falls. This would enable caregivers to receive alerts on other emergency situations occurring within the safe zone.