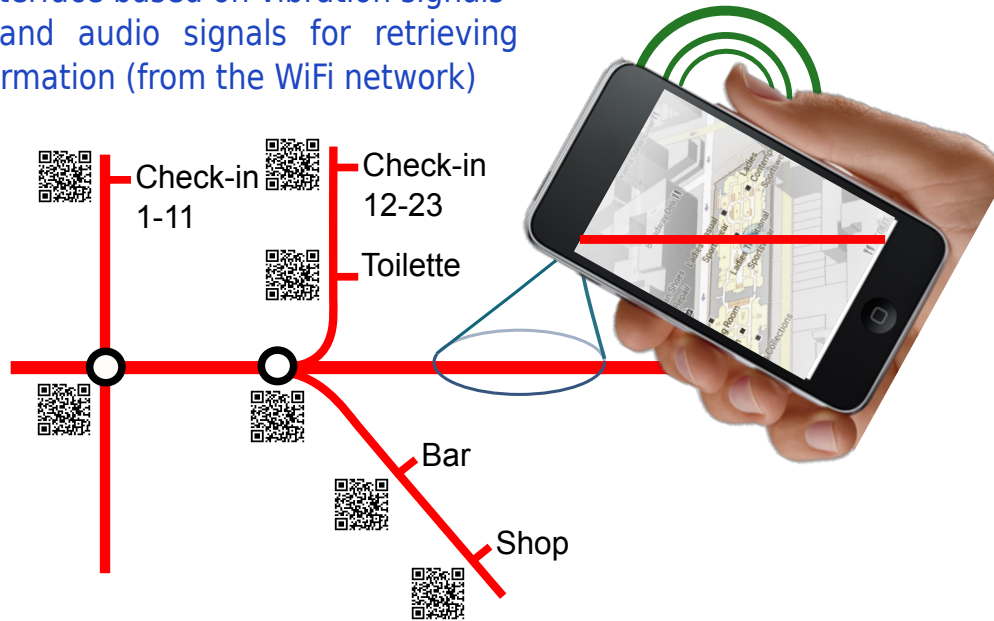


The haptic user interface

- Tactile interface based on vibration signals
- On demand audio signals for retrieving path information (from the WiFi network)



Low impact on hearing

Visually impaired people use hearing to catch information on the near environment. Most assistive navigation tools exploit vocal instructions to inform the traveler about his position and the near environment in a simple form or using virtual acoustic displays, and verbal commands issued by a synthetic speech display. Audio instructions from a piloting device can be perceived as an extra load on an already overloaded sense.

ARIANNA in brief

System characteristics:

- real-time navigation
- obstacle and hazards avoidance
- haptic human-machine interface
- low weight and pocket-size portability
- low-cost solution

Requirements:

no dedicated infrastructure
minimal (or zero) training
off-the-shelf touch-screen phones

What's next:

invisible (infra-red) lines!



UNIVERSITÀ
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DI PALERMO

ARIANNA*

Following the line
with your smartphone

Team: Pierluigi Gallo, Ilenia Tinnirello,
Laura Giarré, Domenico Garlisi,
Daniele Croce and Adriano Fagiolini

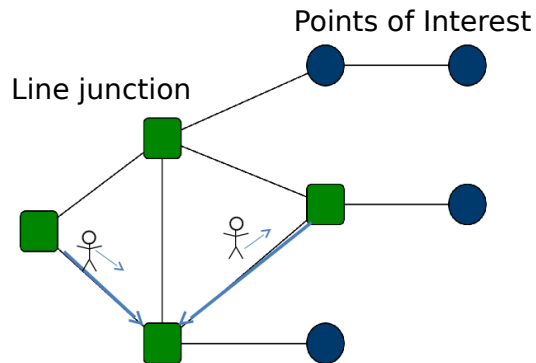
*ARIANNA stands for pAth Recognition for Indoor Assisted Navigation with Augmented perception. Arianna is the Italian name for Ariadne, Minos' daughter in Greek mythology. Her idea to help Theseus in overcoming the Minotauro and come out from the labyrinth is the basic inspiration for our work.



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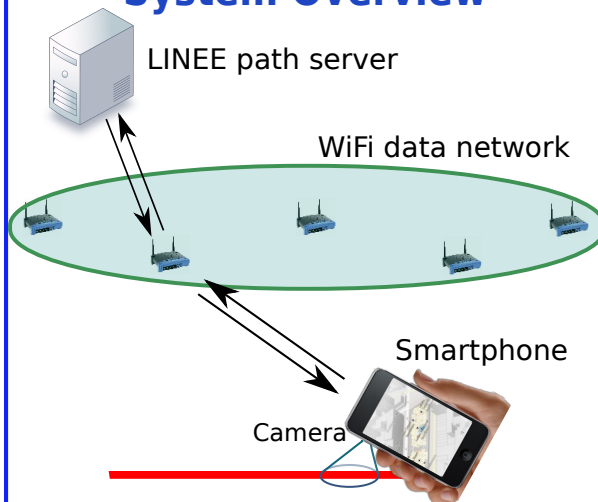
pierluigi.gallo@unipa.it

Scenario



- Navigation is possible along pre-established paths
- The paths are built connecting direction nodes & points of interest

System Overview



- Path reader integrated into the phone
- WiFi network for disseminating path information
- Smartphone for user interface



Path Recognition

- Camera recognizes the path
- Filters are used to distinguish colors, lines, shapes, etc.

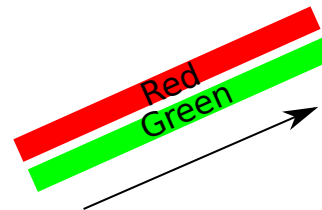
Path coding

- The path can be identified with:
 - Different colors
 - Specific signs along the path
 - QR codes on line junctions and points of interest

Path information can be easily modified on the ARIANNA path server. The updates are sent to the user dynamically through the WiFi network.



Example 1: color codes



- R G** Direct path
- G R** Reverse path

Example 2: bar codes



The bar code may contain information on the path, the location (positioning), the direction, etc.