



Mobile@Old



An Assistive platform for maintaining a Healthy Lifestyle for Elderly People

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1. Introduction
2. Existing Solutions
3. Proposed Solution
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5. Future Work

Motivations	Barriers
Health benefits	Physical (reduced immobility, pain)
Stress relief	Psychosocial (embarrassment)
Self esteem	Societal (schedule time, costs)
Body image	Technological (complexed interfaces)
Maintaining physical activity	Absence of an instructor
Well being	Declined visual & aural acuties



During the development of our platform, we take in consideration all the previous factors.

Different solutions for assisting users at home have been proposed earlier:

- AmbLEDs,
- SPHERE,
- Uranus.

Different multimodal systems have been proposed earlier:

- Canesta,
- AT&T's MATCHKiosk,
- Personal Assistant Solutions (SIRI, Cortana).



The previous solutions:

- are device-dependent (not compatible across all platforms),
- support a single language,
- interfaces doesn't have any adaptive capability.

Mobile@Old Platform

is composed of 2 components connected through a Reminder Tool and has a Multimodal Interface

Vital Sign Monitoring (VS)

Monitors:

- Physiological parameters
(can be automatically):
 - heart rate,
 - blood pressure,
 - glucose.
- Medication plan,
- Physical activity.

Physical Activity Planner (PAT)

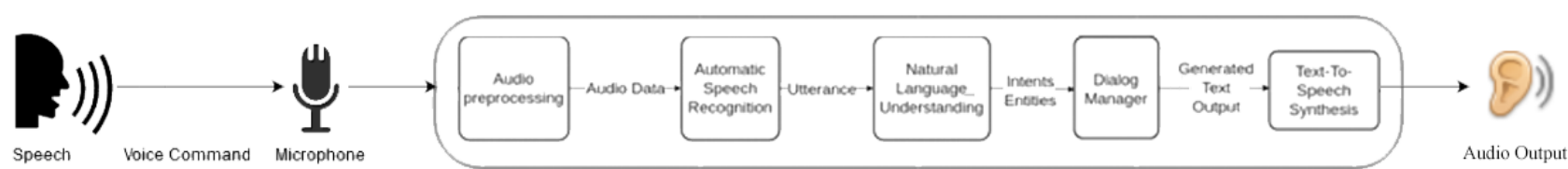
Monitors:

- Recommending physical exercises based on medical expertise and observed behavior.

- Designed by respecting the requirements of the elderly,
- Developed by HTML5 and CSS3,
- Supports two languages,
- Allows a more natural way of interaction between the user and his machines which make the interactions easier for the elderly,
- Adapts itself to any display size and orientation but also to user's preferences and uses (automated),
- Integrates two inputs modules (voice & gesture) beside the traditional and two outputs modules (visual & phonetic),
- Works across platforms.



Verbal communication remains the most successful form of communication between humans and it makes the process of conveying thoughts easier and faster.



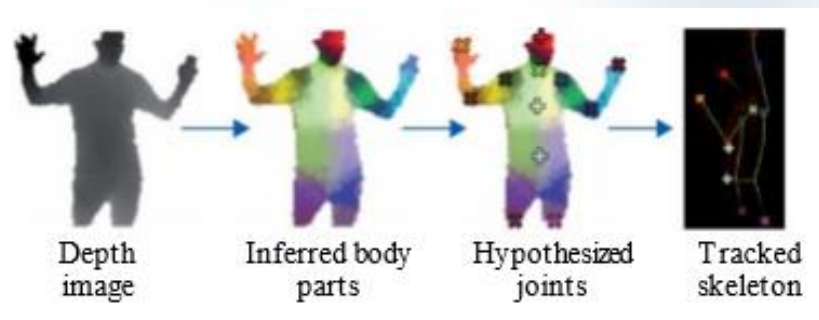
The voice module is composed of five main parts:

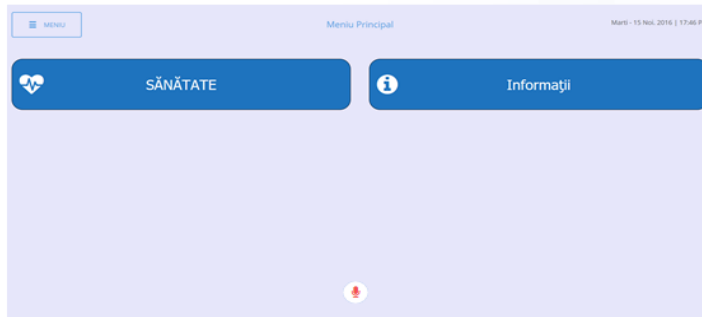
1. Automatic Speech Recognition (ASR),
2. Natural Language Understanding (NLU),
3. Dialog Management module (DM),
4. Natural Language Generation (NLG),
5. Text to Speech synthesis (TTS).

Multiple experiments demonstrated that the elderly find gesture interfaces as an easy way to interact with technology.

Using mathematical algorithms, gesture recognition allows machines to interpret and understand the human body language.

To achieve this, recognition devices that have capability of motion acquisition (e.g. Kinect) should be employed.





Main Menu



Elder Interface

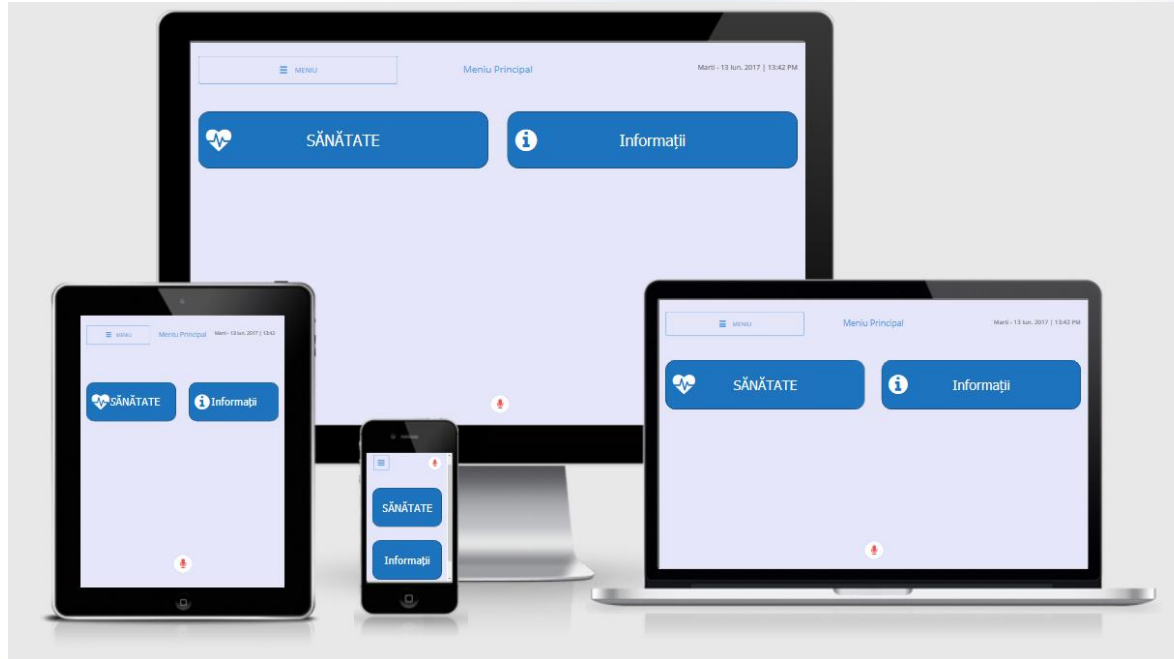


Measurement Menu



Measurement Result Screen

The multimodal interface has been tested on multiple devices with different screen sizes and different operation systems. It was compatible and responsive across all tested devices.



English Utterance	Average Lev. Score
Did I took my medicine	89.94
What time is it	95.64
How will be the weather tomorrow	91.23
What appointments do I have today	88.73

Romanian Utterance	Average Lev. Score
Mi-am luat medicamentele	82.51
Cât este ceasul	86.39
Cum va fi vremea maine	83.23
Ce intalniri am astazi	81.14

Conclusions:

- Self-efficacy plays an important role for exercise behavior,
- The multimodal interface make the interaction easier between the elderly and the system,
- The adaptive capability of the system will enrich the users experience and optimize the benefits of the system.

Future Work:

- Applying some error prevention methods,
- Recognizing more gestures,
- Testing the whole system,
- More field trials.

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