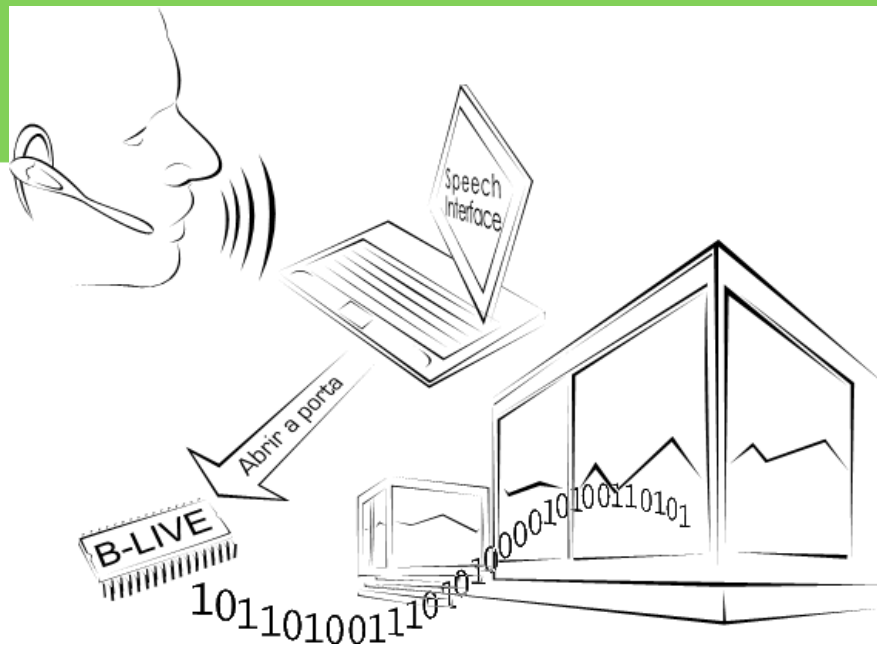


Speech Enabled Interface to Home Automation for Disabled or Elderly People

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Micro I/O
www.microio.pt

 universidade
de aveiro


ieta

1. Introduction

I. B-live



- **B-Live's group**
 - *University of Aveiro*
 - *Centro de Medicina de Reabilitação da Região Centro – Rovisco Pais*
 - *Micro I/O*
- **Main idea:**
 - *B-live helps on the rehabilitation of seriously disabled persons:*

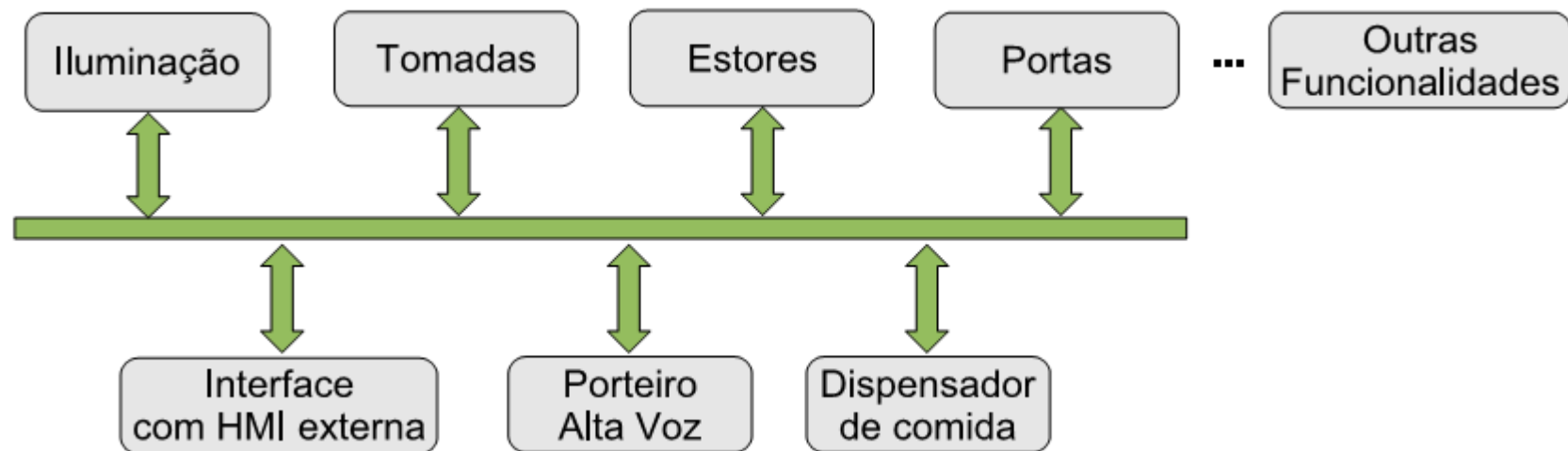
1. Introduction

II. Home automation system B-live

- ***B-Live characteristics:***

- Modular
- Adapted user interfaces:
 - Mobile phone, computer
 - Wireless switch or mouse controlled by lip movements.

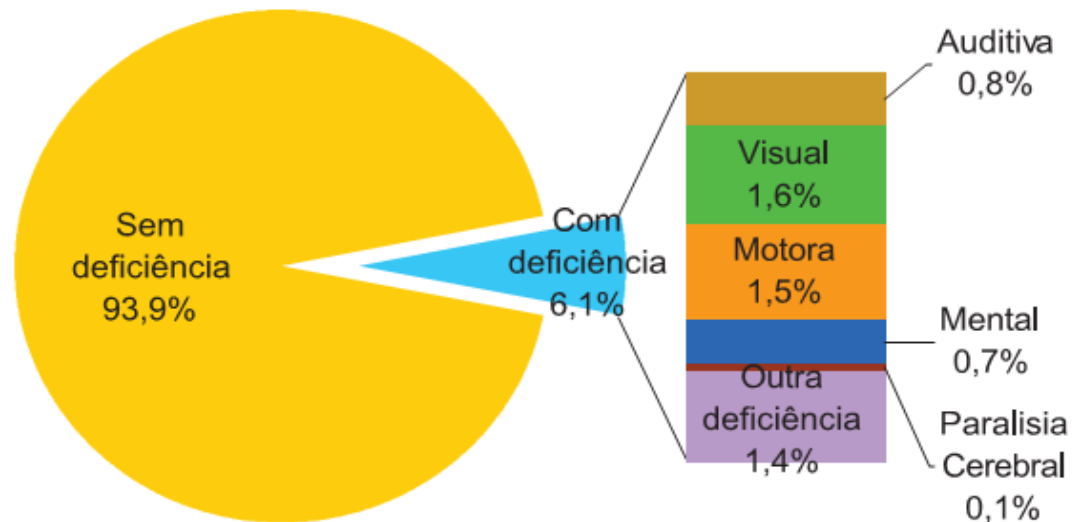
- ***Features***



1. Introduction

III. Motivation

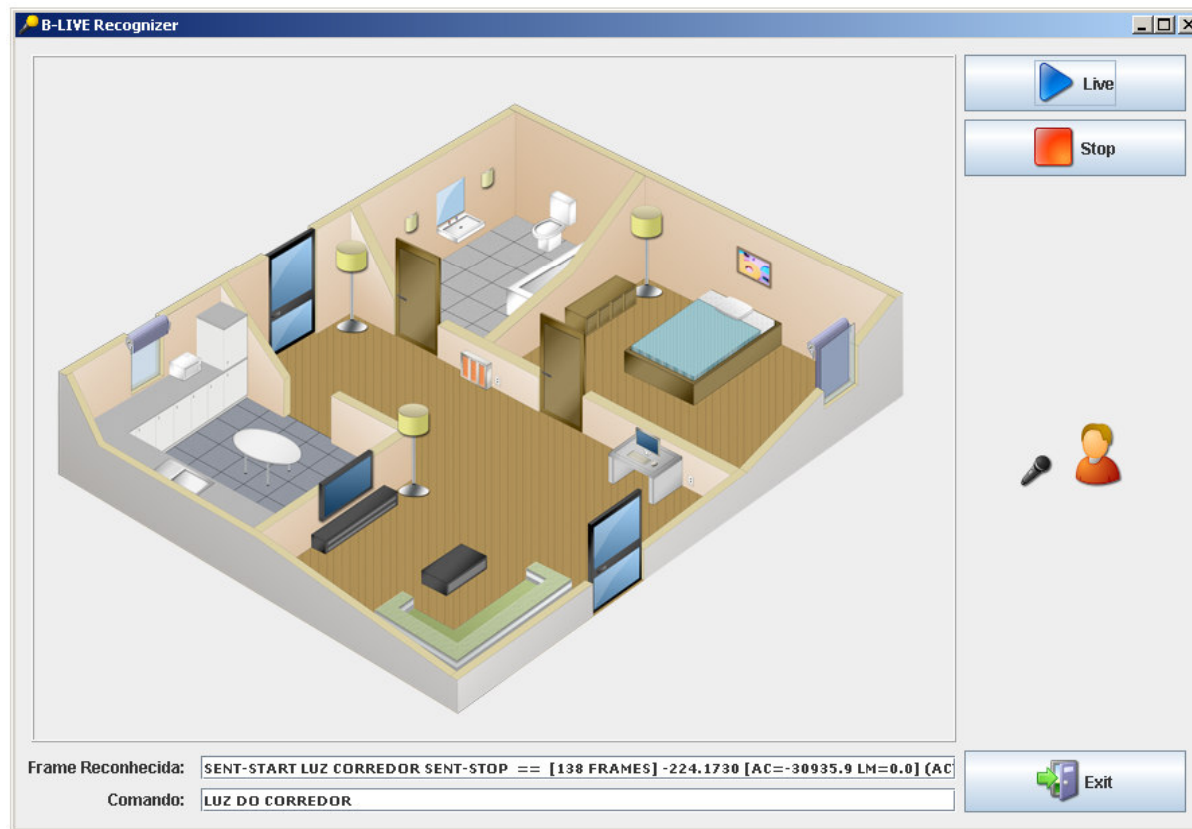
- **Number of portuguese disabled persons in Portugal:**



1. Introduction

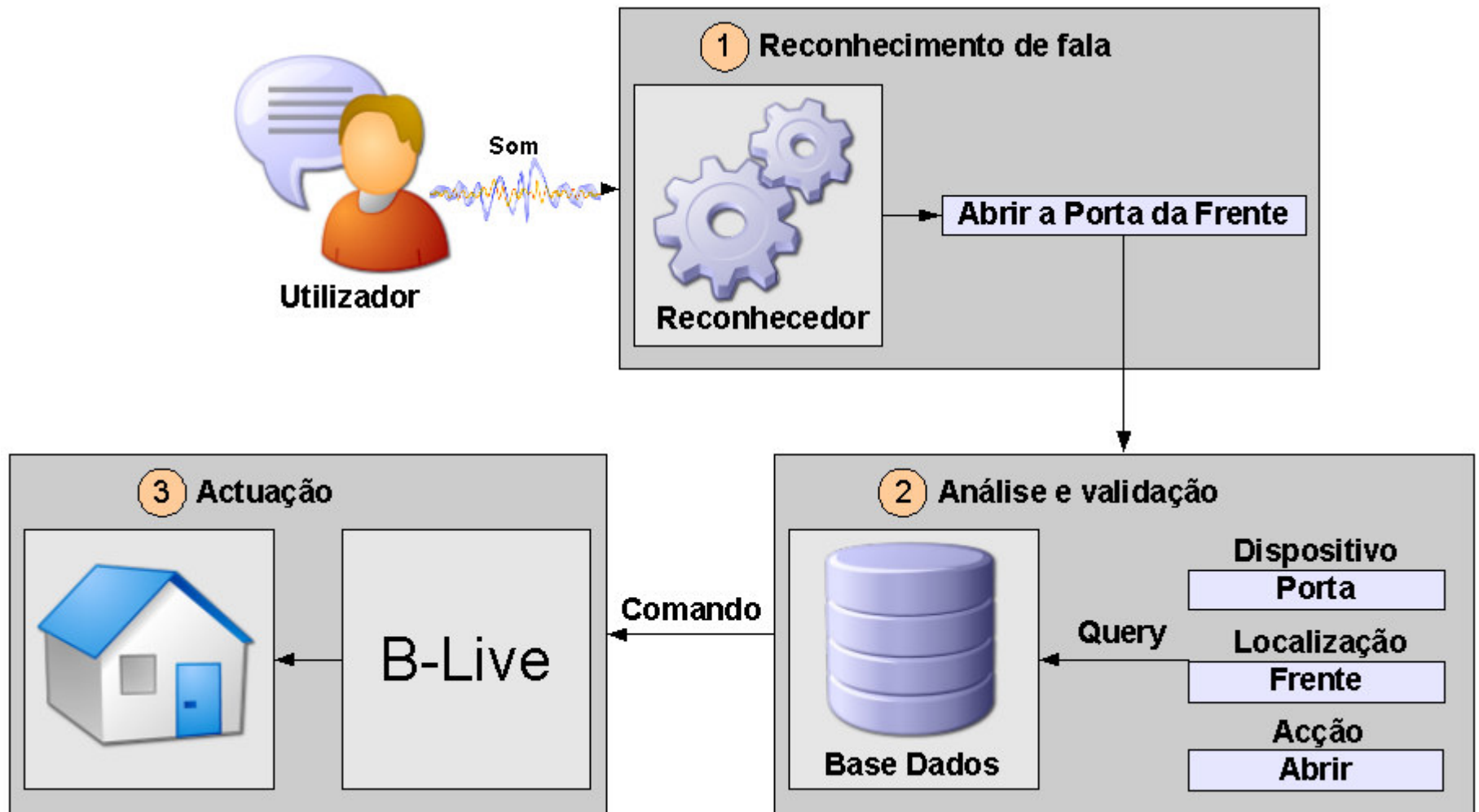
IV. Objectives

- *To develop an human-machine interface based on speech recognition*



Speech recognition interface for physically challenged persons

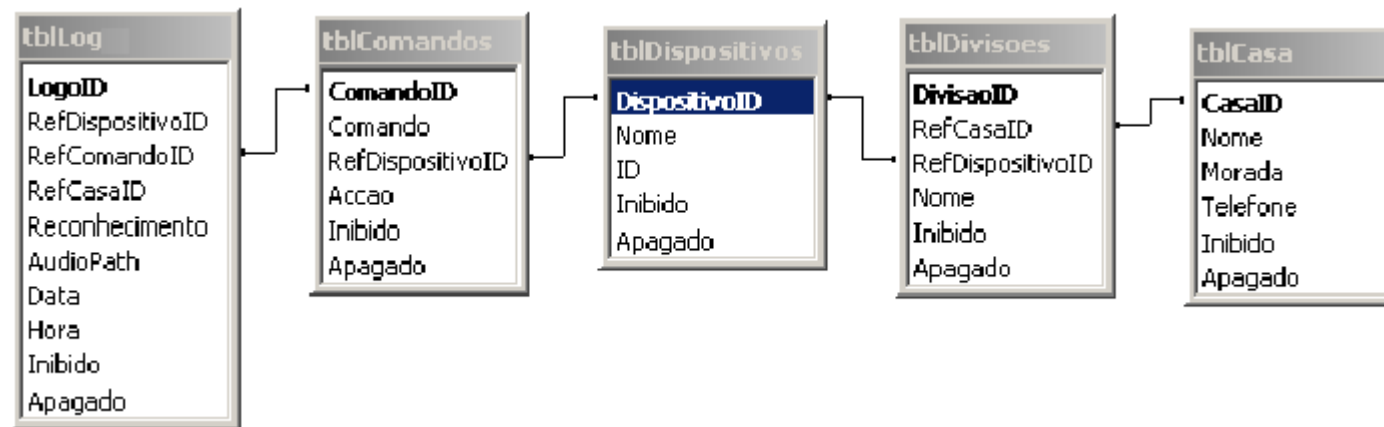
I. Funcionalidade



Speech recognition interface for physically challenged persons

III. Data base

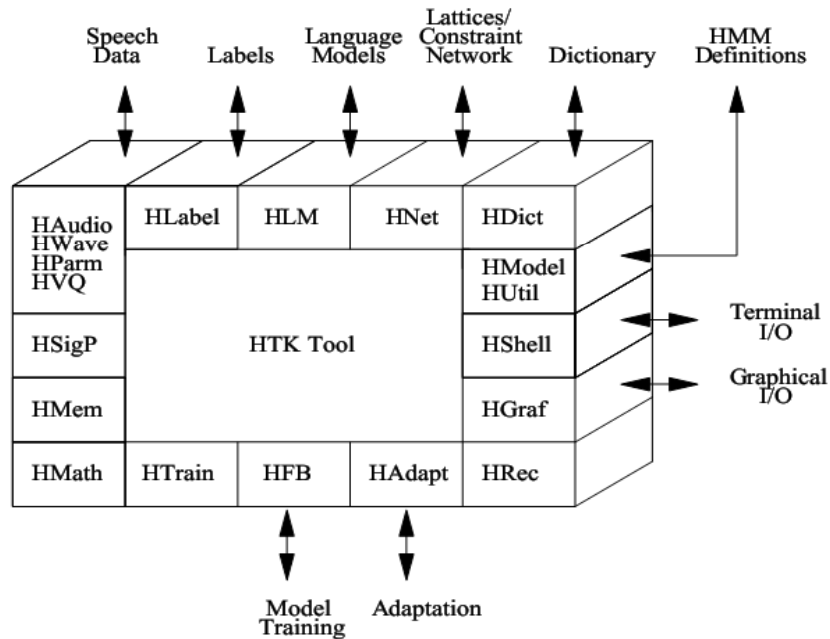
- **Stores system information**
- **Records the operation history**
- **Preserves information**



Speech recognition interface for physically challenged persons

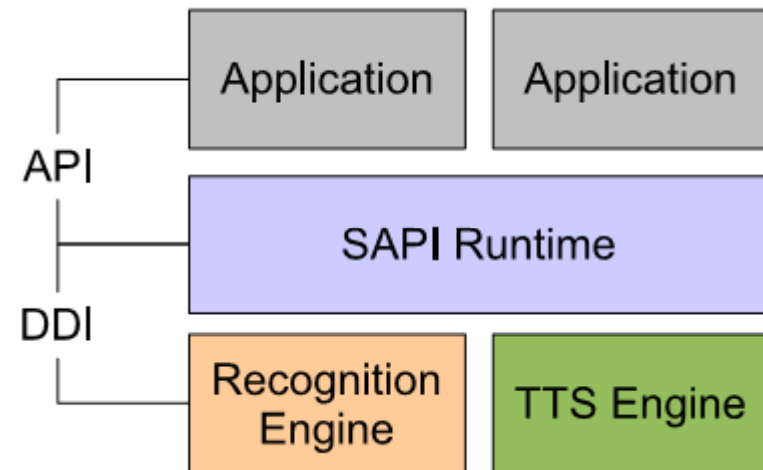
IV. Speech Recognition tools

Hidden Markov Model Toolkit - HTK



User dependent ASR system

Microsoft Speech API - SAPI



User independent ASR system

Results

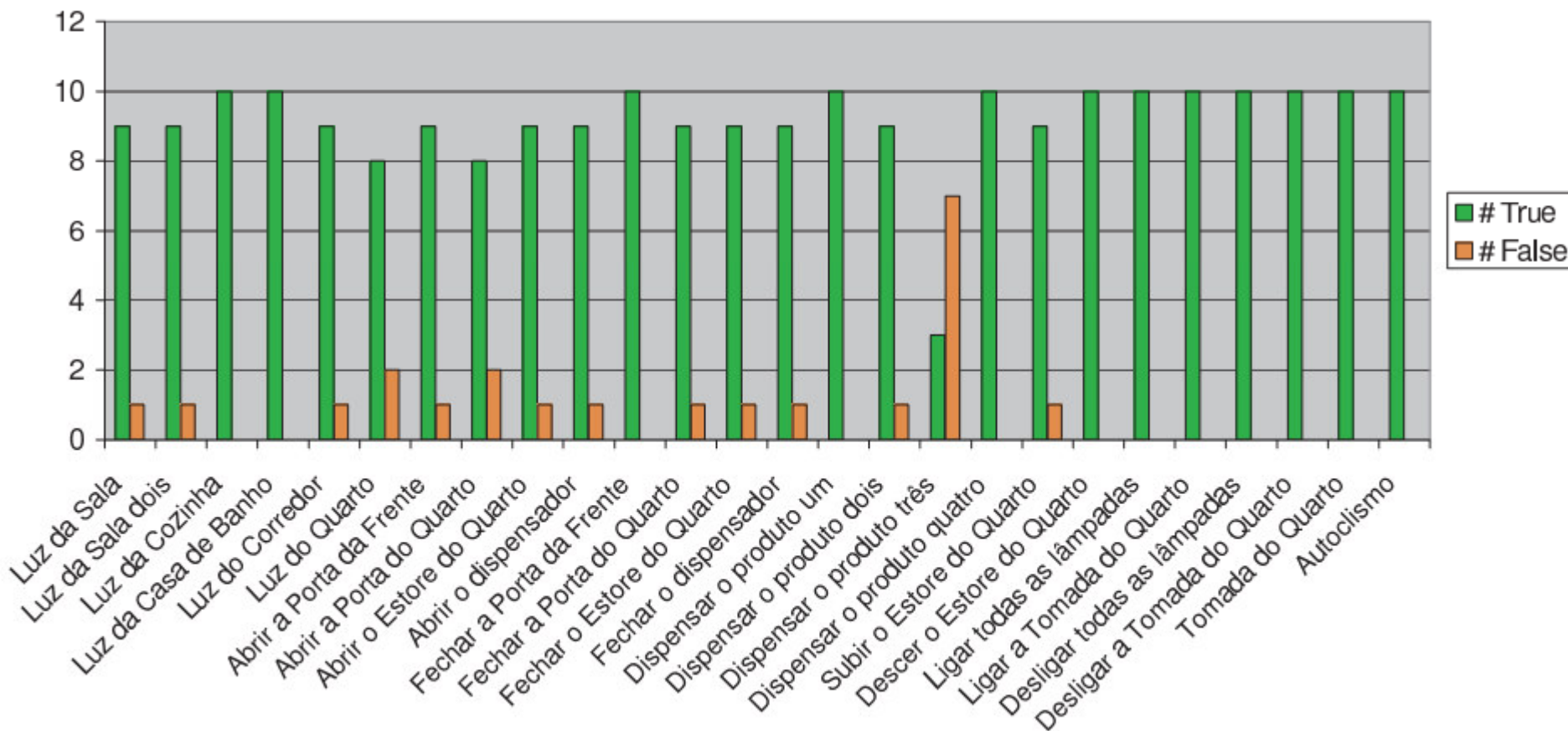
I. Experiments

- ***Lab Environment***
- ***At Centro de Reabilitação da Região Centro – Rovisco Pais***
 - *Disabled Users with different speech characteristics*
 - *Two male and two female*
 - *They used the interface in two different real life scenarios*
 - *They performed an qualitative evaluation*

Results

III. Lab environment– Results with SAPI recognizer

Correctly recognized commands
91,54%



Results

IV. Usability scenarios at Centro de Reabilitação da Região Centro – Rovisco Pais

- **1st scenario – the WC**

- Turn on the room light
- Open the door
- Turn on the WC light
- Close the door
- Flush
- ...

- **2nd scenario – the Street**

- Turn off the power socket
- Turn off the room light
- Open the front door
- Close the front door
- ...



Results

V. @Reabilitação da Região Centro – Rovisco Pais

- The several usability scenarios were successfully concluded by all three users.
- They've evaluated the interface positively.



Results

VI. Some examples

Acha positivo utilizar a fala para interagir com a casa?

■ Sim.

Porquê?

Facilidade de utilização,
Liberta as mãos para outras acções (cadeira eléctrica),
Na posição deitada é difícil utilizar as outras interfaces.

Se pudesse utilizar esta interface no seu dia a dia, a sua vida ficaria:

■ Mais simplificada.

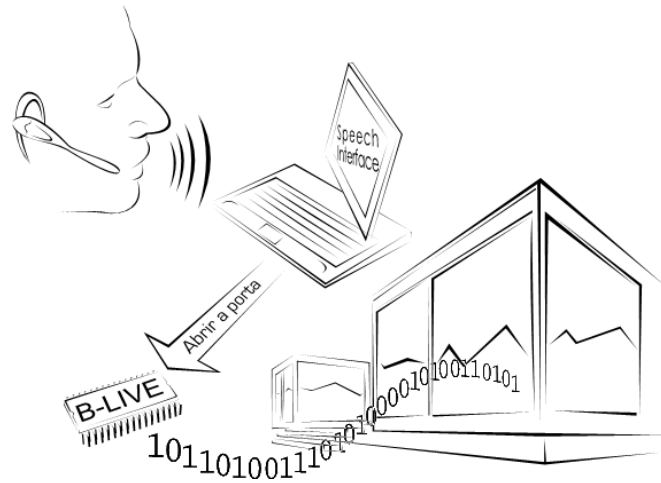
Porquê?

Maior autonomia e mobilidade,
Poder operar a partir de qualquer lugar.



Thank you

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