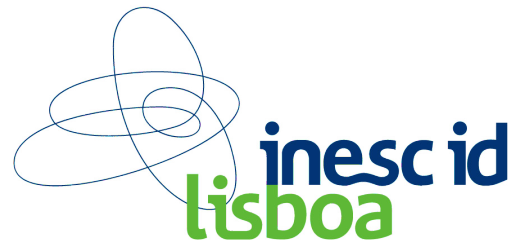# Let us talk about (Portuguese) Sign Language Translation!

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Overview

- About Sign Languages
- About the Portuguese Sign Language
- The translation platform
  - Goal
  - Components
- Main Challenges

About Sign Languages

- Sign Languages…
  - … are natural human languages
  - … merge manual communication and body language:
    - manual features = different hand shapes, orientation and movement of the hands.
    - non-manual features = body movements (upper torso), facial expressions

About Sign Languages

- Sign Languages…
  - … have their own vocabulary and grammatical rules

  It is very difficult to take advantage of existing resources when moving to a new sign language!

About Sign Languages

- Some (possibly accurate) numbers:
  - ~70 million people use a sign language in the world (*360 million hearing impaired in the world*);
  - ~300 distinct sign languages in the world;
- No official text representation for any sign language.

About Portuguese Sign Language

- Língua Gestual Portuguesa (LGP) is the Portuguese Sign Language
- Official recognized since 1997
- No official number for people using LGP in Portugal
  - The 2011 census mentions 27,659 deaf persons
    - no distinction in the level of deafness, and on the respective level of LGP literacy

About Portuguese Sign Language

- LGP resources:
  - A "grammar" from 1994
  - A dictionary ("gestuário") from 97 and newer one from 2010
  - The Spreadthesign project
    - http://www.spreadthesign.com
  - ...
  - Recently: online dictionary from Porto Editora

Overview

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- About the Portuguese Sign Language ✔
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The EP2LGP platform: goal

- Develop a free, open source platform, that translates, in real time, (written) European Portuguese (EP) into Portuguese Sign Language (LGP), being the signs produced by an avatar.
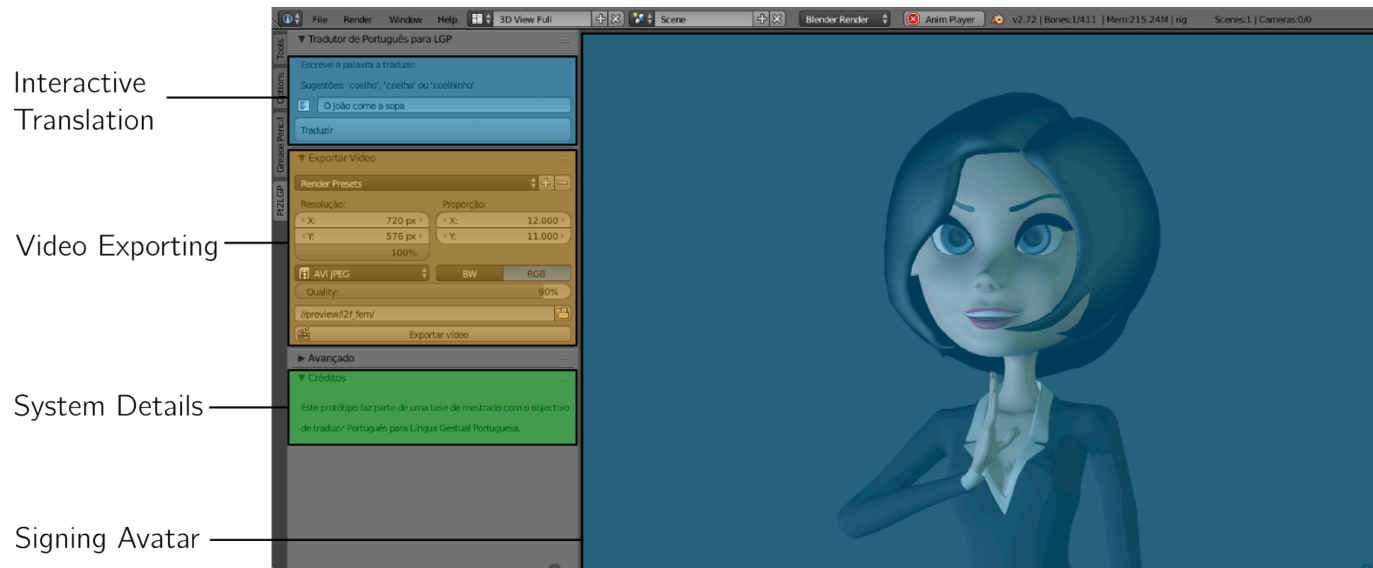
Interactive Translation

Video Exporting

System Details

Signing Avatar

The EP2LGP platform: components

- A module for Natural Language Processing
- A module for the avatar
- A module for adding signs

The Natural Language Processing module

- A coelhinha Ana come a cenoura (*little female rabbit Ana eats a carrot*)
  - Tokenizador + Lematizador + POS tagger
- [(a, art), (coelhinha, nc), (ana, np), (come, v), (a, art), (cenoura, nc)]
  - Named Entity Recognition + Lexical Transfer
- [(G, coelho + fêmea + pequeno, nc), (FS, ana, np), (G, comer, v), (G, cenoura, nc)]
  - Syntactic Rules
- [(G, cenoura, nc), (G, coelho + fêmea + pequeno, nc), (FS, ana, np), (G, comer, v)]

The Avatar module

- 57 hand configurations
- Around 15 signs
  - carrot, rabbit, house, female, small, ...

The Avatar module

The EP2LGP platform: components

- A module for Natural Language Processing ✔
- A module for the avatar ✔
- A module for adding signs

A module for adding signs (I)
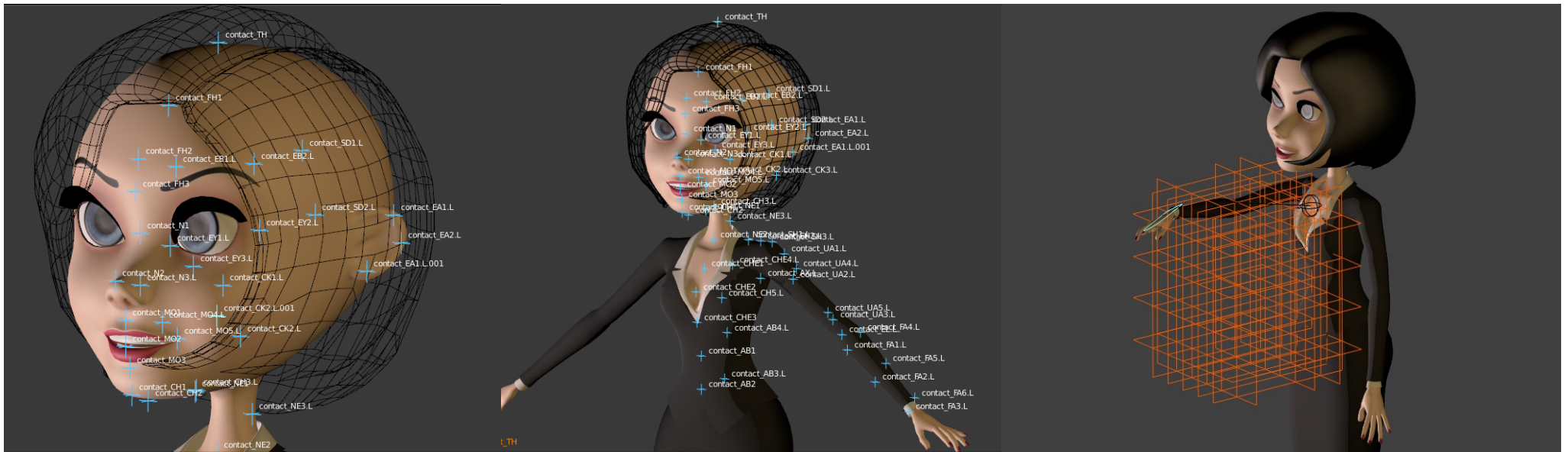
A module for adding signs (II)

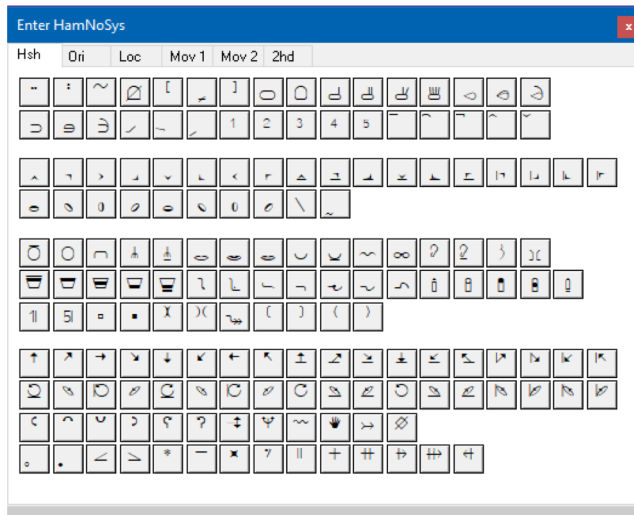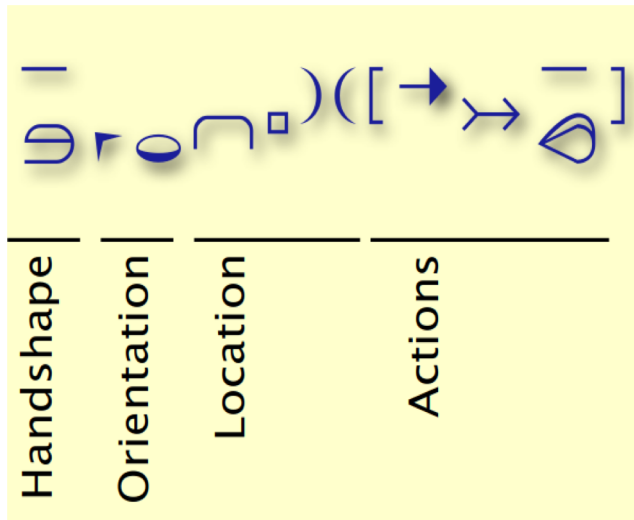# A module for adding signs (II)
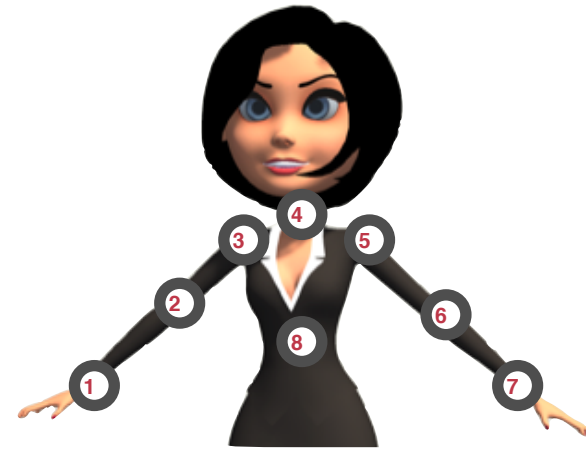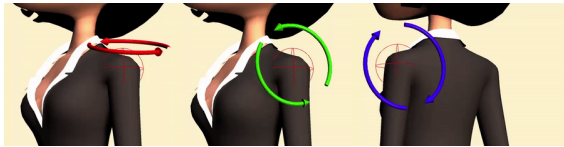
A module for adding signs (II)
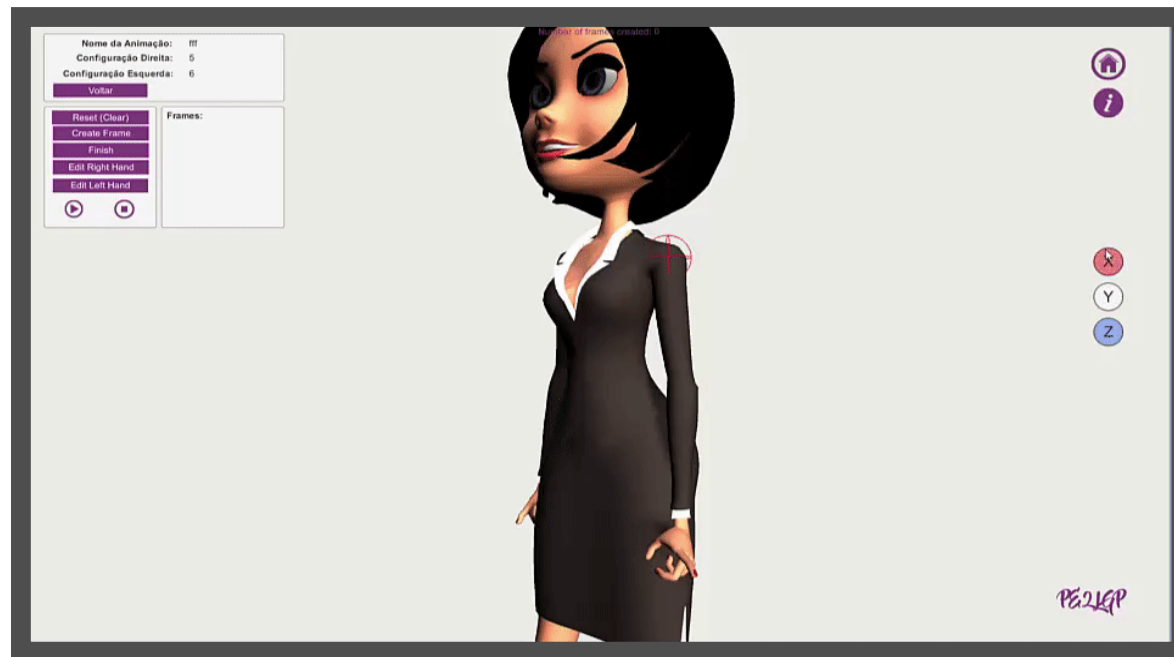
A module for adding signs (III)

A module for adding signs (IV)

http://vh.cmp.uea.ac.uk/index.php/JASigning
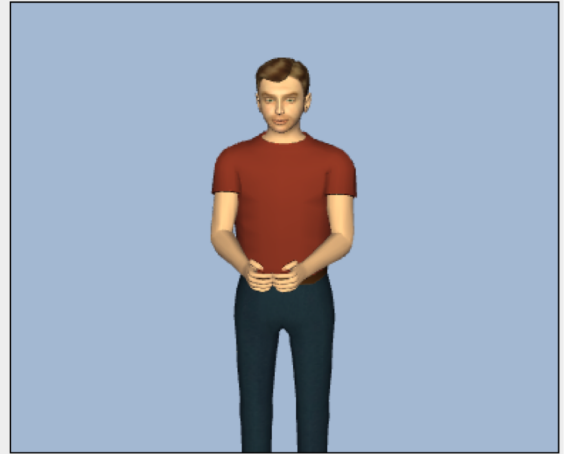
The word "baixo" (short)

The word "noite" (night)

EP2LGP
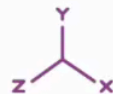
Main challenges

- LGP grammar
- How to fasten the insertion of signs in the platform?
  - The crowd is needed!!!!!
- How to improve the available signs?

Corpus & Avatar da LGP

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