
Menusigne: A Serious Game for Learning Sign Language Grammar

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Overview

- Sign language in three minutes
- Overview of Mensigne game
- Implementing Mensigne
- Content

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Sign languages

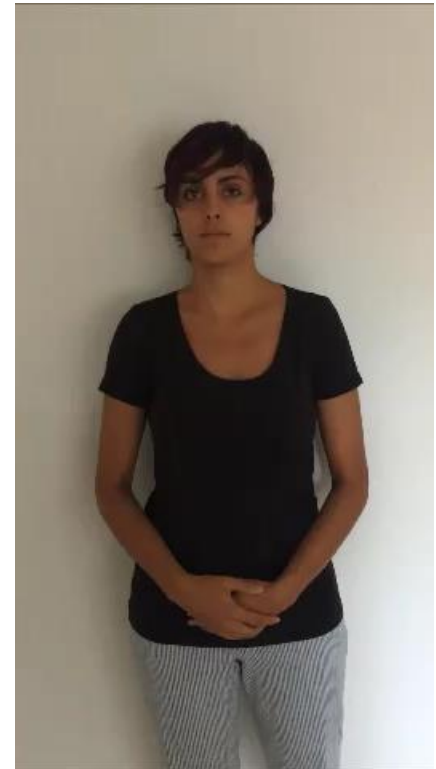
- ~200 sign languages worldwide
- Natural (not artificial) languages
- Own syntactic structures
- As complex as spoken languages, but different...
 - “Multi-linear”: simultaneous use of hands, eyes, eyebrows, mouth, head, shoulders...
 - “Spatial”: realized in 3-D rather than 1-D
 - “Oral”: no written form of language

French and LSF

- LSF = Langue des Signes Française
- Completely different from French
- No characteristic French syntax, e.g. no
 - Agreement
 - Complex verb tenses
 - Inverted word-order for questions
 - Double negation
 - ...

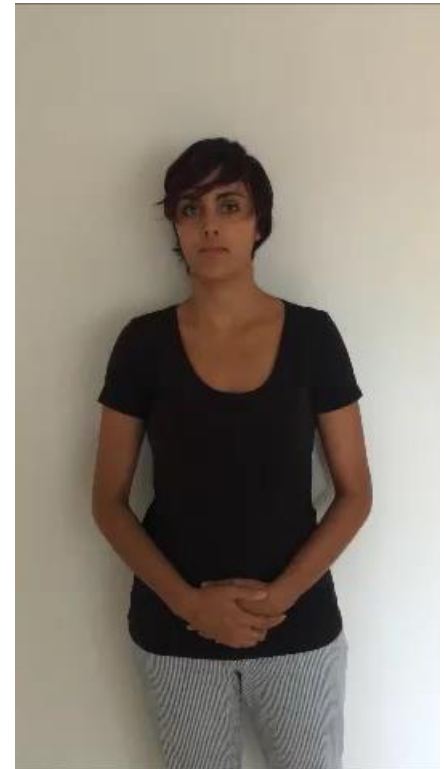
French and LSF (2)

- **ENG** “I am Swiss”
- **FRE** “Je suis suisse”
- **LSF** MOI SUISSSE



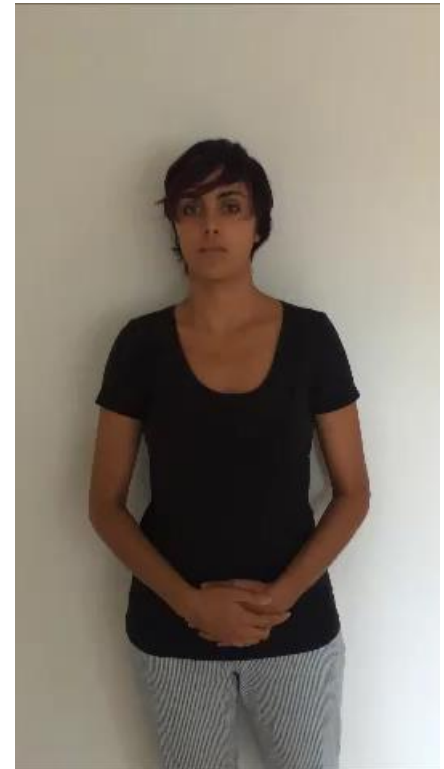
French and LSF (3)

- **ENG** “I am not Swiss”
- **FRE** “Je ne suis pas suisse”
- **LSF** MOI SUISSSE PAS
(eyebrows-up)
(headshake)



French and LSF (4)

- **ENG** “Are you Swiss?”
- **FRE** “Êtes-vous suisse?”
- **LSF** TOI SUISSE
(eyebrows-up)
(head-down)
(shoulder-forward)



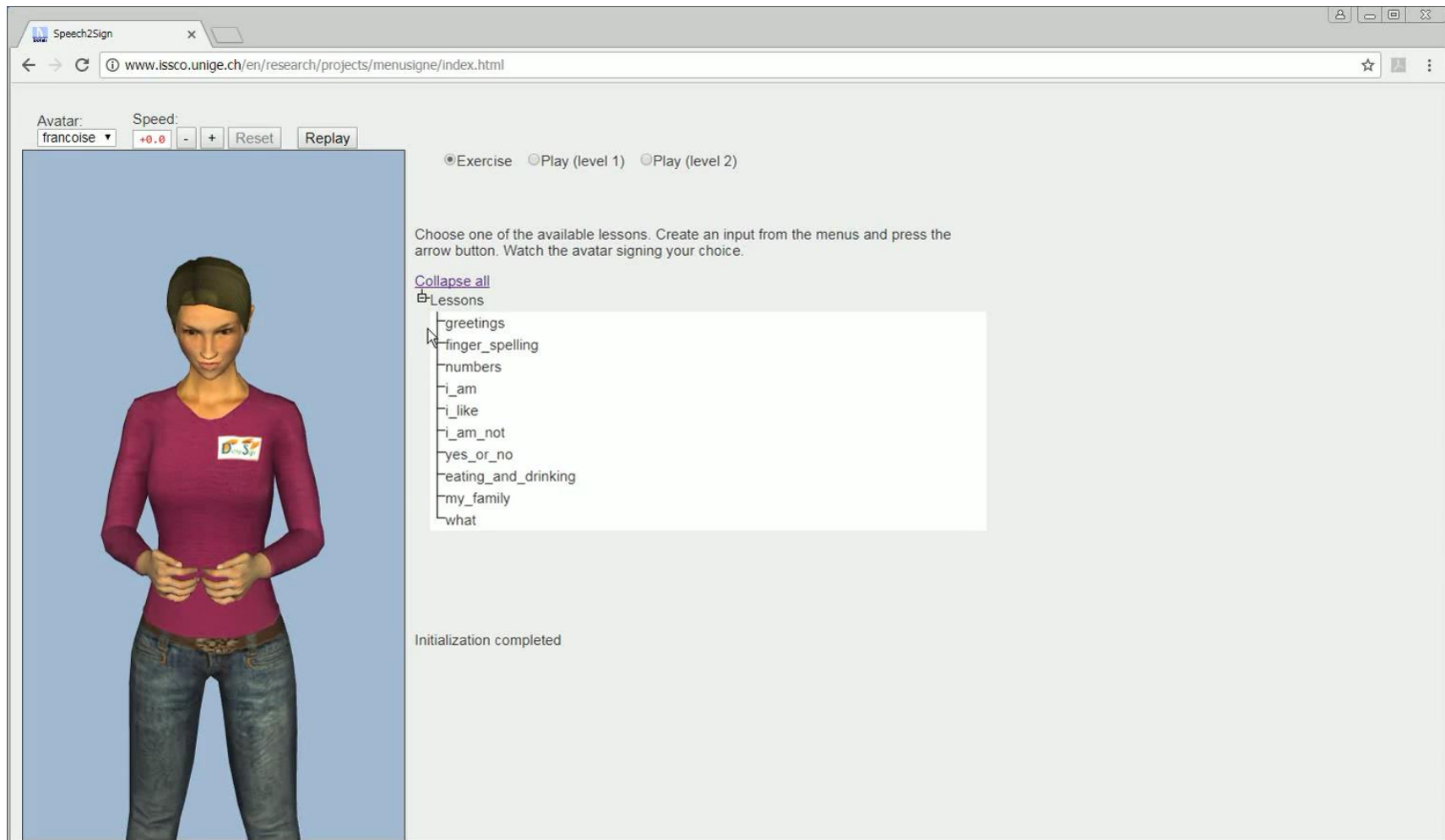
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Goals of Mensigne project

- Experiment with using non-trivial technology for sign language CALL
 - (Current apps are very simple...)
- Build an app for learning grammar, using
 - Grammar-based generation
 - Rule-based translation
 - Signing avatar
- Create an initial LSF course

Menusigne functionality: practise



The screenshot shows a web browser window with the URL `www.issco.unige.ch/en/research/projects/menusigne/index.html`. The interface includes an "Avatar" dropdown menu set to "francoise", a "Speed" control with a value of "+0.0" and buttons for "- + Reset Replay", and three radio buttons for "Exercise", "Play (level 1)", and "Play (level 2)". A 3D avatar of a woman in a purple shirt and jeans is visible on the left. On the right, there is instructional text: "Choose one of the available lessons. Create an input from the menus and press the arrow button. Watch the avatar signing your choice." Below this is a "Collapse all" link and a tree view of lessons: "Greetings", "finger_spelling", "numbers", "i_am", "i_like", "i_am_not", "yes_or_no", "eating_and_drinking", "my_family", and "what". The "finger_spelling" item is selected. At the bottom, it says "Initialization completed".

Speech2Sign

www.issco.unige.ch/en/research/projects/menusigne/index.html

Avatar: francoise Speed: +0.0 - + Reset Replay

Exercise Play (level 1) Play (level 2)

Choose one of the available lessons. Create an input from the menus and press the arrow button. Watch the avatar signing your choice.

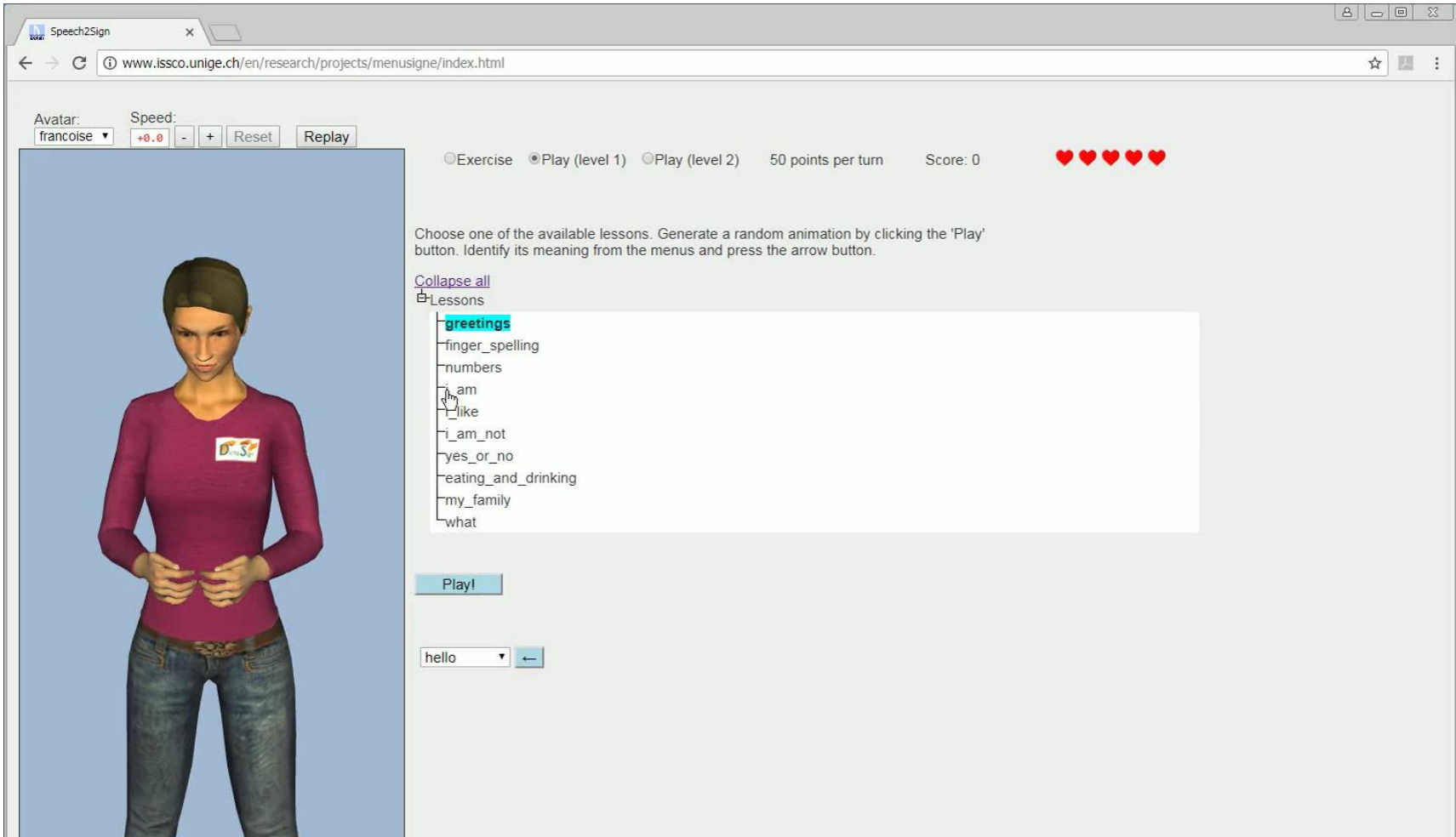
[Collapse all](#)

Lessons

- greetings
- finger_spelling
- numbers
- i_am
- i_like
- i_am_not
- yes_or_no
- eating_and_drinking
- my_family
- what

Initialization completed


Menusigne functionality: play/avatar



Speech2Sign

www.issco.unige.ch/en/research/projects/menusigne/index.html

Avatar: francoise Speed: +0.0 - + Reset Replay

Exercise
 Play (level 1)
 Play (level 2)
 50 points per turn
 Score: 0
 


Choose one of the available lessons. Generate a random animation by clicking the 'Play' button. Identify its meaning from the menus and press the arrow button.

[Collapse all](#)

Lessons

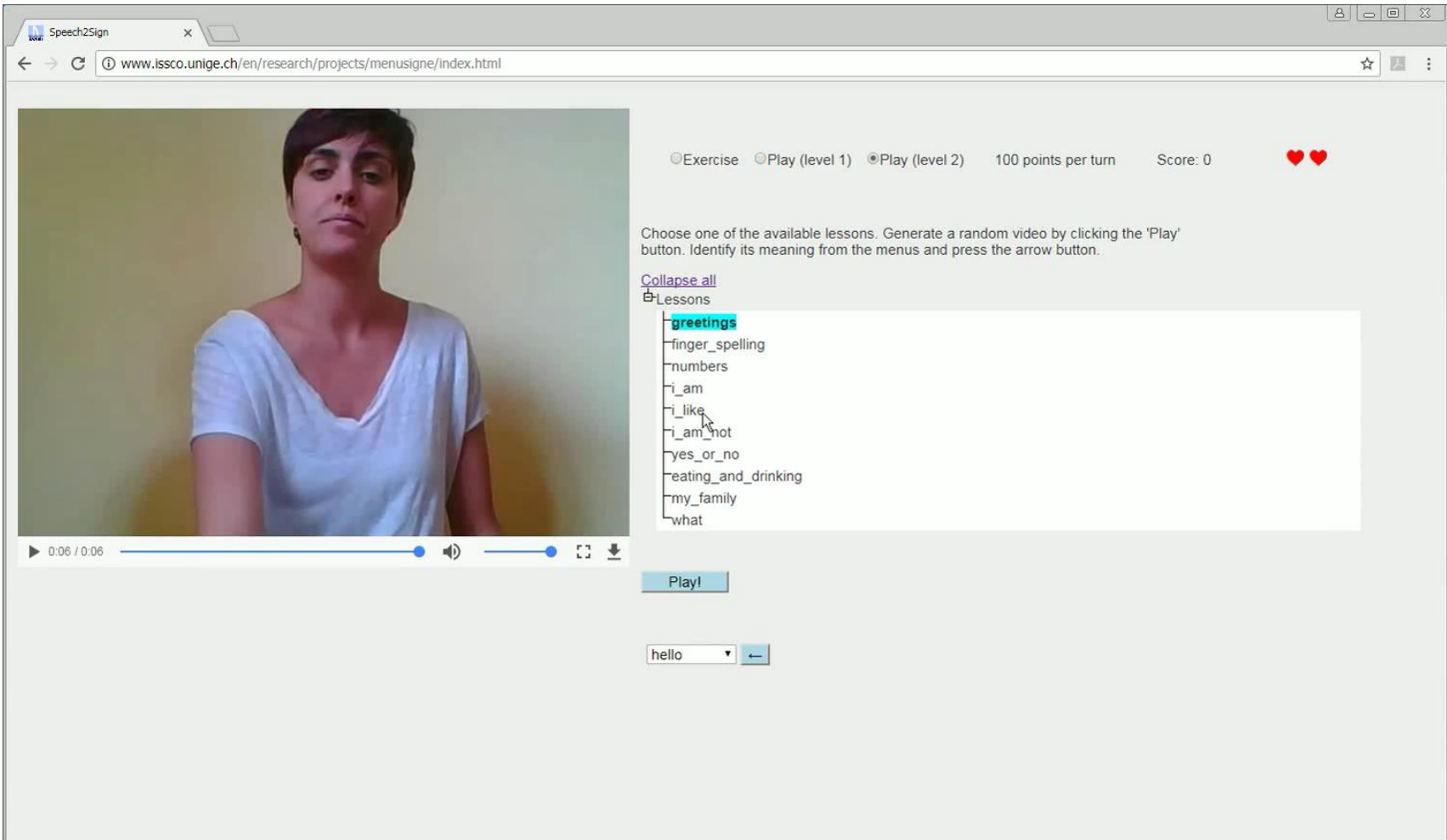
- greetings**
- finger_spelling
- numbers
- i_am
- i_like
- i_am_not
- yes_or_no
- eating_and_drinking
- my_family
- what

Play!

hello 


The screenshot shows a 3D avatar of a woman in a purple top and jeans. The interface includes a speed control, a 'Play' button, and a list of lesson categories. The 'greetings' category is highlighted, and the word 'hello' is selected in a dropdown menu at the bottom.

Menusigne functionality: play/video



Speech2Sign x

www.issco.unige.ch/en/research/projects/menusigne/index.html

Exercise
 Play (level 1)
 Play (level 2)
 100 points per turn
 Score: 0
 

Choose one of the available lessons. Generate a random video by clicking the 'Play' button. Identify its meaning from the menus and press the arrow button.

[Collapse all](#)

Lessons

- greetings**
- finger_spelling
- numbers
- i_am
- i_like
- i_am_hot
- yes_or_no
- eating_and_drinking
- my_family
- what

Play!

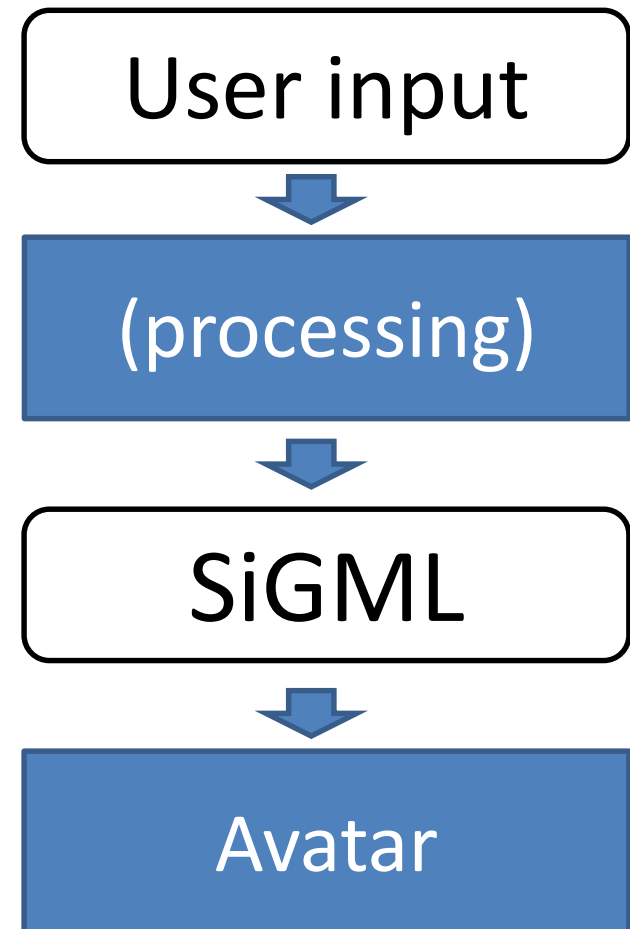
hello ▾ ↵

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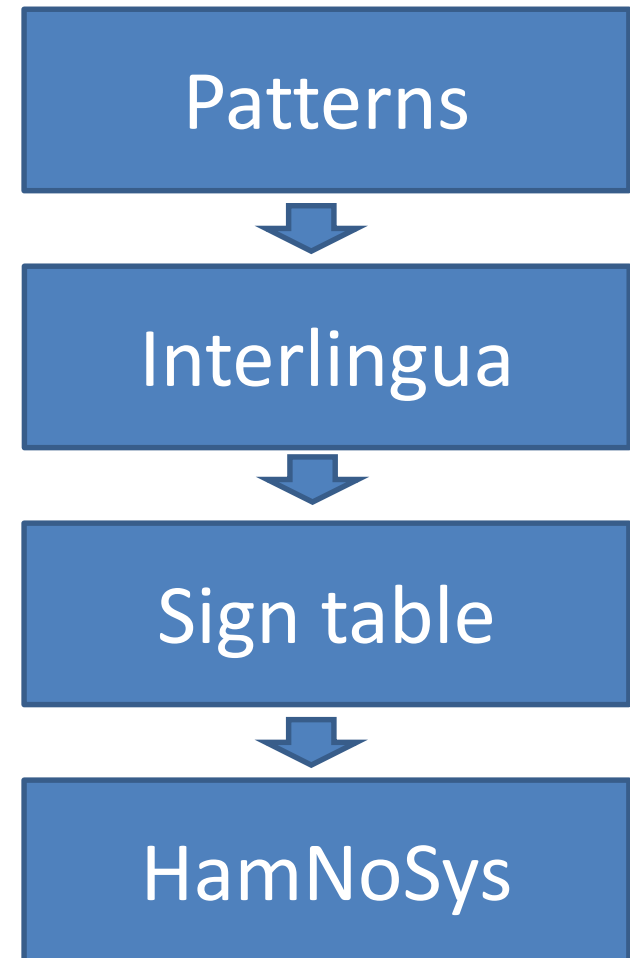
Menusigne: processing

User input from the menus is processed into SiGML and sent to the signing avatar



Menusigne: levels of representation

Rules map representations at each level to the one below



Levels of representation: patterns

- Define a menu line
- Example:

are you \$\$nationality

Levels of representation: interlingua

- Define abstract meaning
- Example:

`yn-question you $$nationality`

- Patterns transformed into interlingua using simple translation rules

Levels of representation: sign table

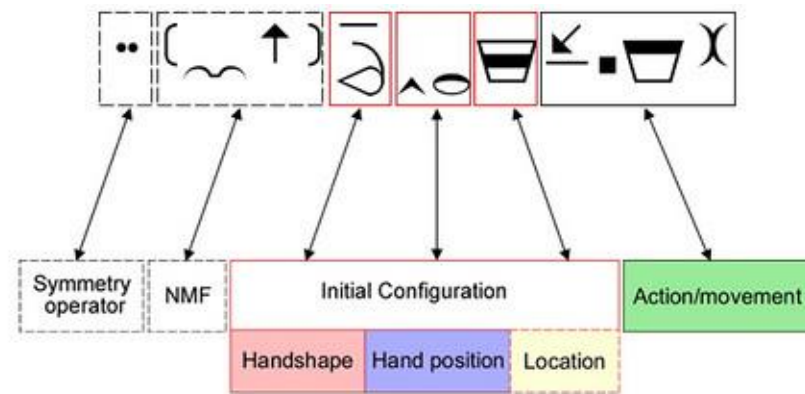
- Define abstract syntax
- Example:

Gloss	TOI	\$\$nationality
Eyebrows	Neutral	Up
Head	Neutral	Down
Shoulders	Neutral	HunchRightForward

- Interlingua transformed into sign table using GPSG-style grammar

Levels of representation: HamNoSys

- Define “phonology” (actual hand movements)
- Example:



- Sign table transformed into HamNoSys using LIMSI lexicon

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Content

- Initial course for LSF
- ~125 signs (from LIMSI lexicon)
- Basic grammar

Content (2)

Name	Grammar	Signs	Patterns	Videos
Greetings	Politeness	4	1	4
Letters	Finger-spelling	28	3	8
Numbers	Numbers	27	6	18
I am	Adjectives	15	4	16
About me	Declarative sentences	27	10	21
Negation	Negated sentences	1	7	27
Questions	Yes-no questions	0	7	20
Food and drink	Requesting	16	11	18
My family	Third-person subjects Possessives	7	7	39
What?	WH-questions	1	2	4

Initial reactions

- This prototype can be useful for basic sign language sentences and lexicon!
- Biggest problem is with videos
 - Natural videos... are hard to understand
 - Comprehensible videos... are not natural
 - Compromise solution: still experimenting

What next

- Collaborating with sign language teachers
- A structured course
- Other sign languages
 - If you want to collaborate, please contact us!

Contact us if you want to collaborate

Or try it out yourself at

<http://speech2sign.unige.ch/en/applications/menusigne/>