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# Visual Interactive System for Teaching and Assessment of Sign Languages

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ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ
UNIVERSITY OF PATRAS















# The current situation in SL education

- There are around 750,000 native speakers of SLs in the EU
- There is lack of SL teachers
- Need for high-quality learning systems utilizing feedback
- Lack of training curricula in HEIs including gamification
- Need for an affordable e-learning platform and content for SL

- The VISTA-SL project aims to contribute towards narrowing this gap

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# The VISTA-SL objectives

- To develop a system/service for interactive SL teaching prodiding automated feedback to the user.
- To introduce personalized learning paths in SL teaching using AI.
- To introduce gamification in SL teaching.
- To develop curricula and guides for teaching SL in Greece, Germany, Ireland and Netherlands; to support switching between SLs.
- Develop avatar for better personalization and multiple view angles

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# The target groups - end users

- The students at Special Education university departments, aiming to learn how to use and teach SLs.
- University professors teaching SLs in Special Education departments.
- Educators in public or private organizations involved in SL teaching or Deaf education.
- Technology developers and researchers for accessibility
- Policy Makers and policy influencers including Deaf - HoH Associations and Educational Authorities
- The general public

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# The project

- Visual Interactive System for Teaching and Assessment of Sign Languages
- Duration: 3 years (February 2025 - January 2028)
- Funded by Erasmus+ KA220-HED - Cooperation partnerships in higher education
- 6 Partners from 5 countries




**Greek State Scholarship's Foundation (IKY)**

**Ref. Project: 2024-1-EL01-KA220-HED-000257847**

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# The partners



University of Patras

Coordinator: Professor D. Kosmopoulos

Signal Processing and Communications Lab - Computer Engineering and Informatics Dept.

- Hand / Body tracking
- Platform design

Deaf Studies Unit - Dept. of Educational Sciences and Social Work

- Courses for the Greek SL
- Requirements

# The partners



OLLSCOIL TEICNEOLAÍOCHTA BHAILE ÁTHA CLIATH
TU DUBLIN
TECHNOLOGICAL UNIVERSITY DUBLIN

Technological University Dublin - Trinity College

ADAPT Centre

Head: Dr Irene Murtagh

- Courses for the Irish SL
- Requirements
- Validation

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# The partners




## Hellenic Mediterranean University

Head: Dr. Kostas Karampidis

Intelligent Systems & Computer Architecture Lab

Electrical and Computer Engineering Dept.

- Development of LLMs for course personalization
- Development of educational games

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# The partners



Royal Dutch Kentalis

Head: Senior Researcher Dr Ben Elsendoorn

Kentalis Academy

- Users' requirements
- Courses for the Dutch SL
- Courses for School pupils

# The partners



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

University of Hamburg

Head: Prof. Annika Herrmann, Prof. Liona Paulus

Institute of German Sign Languages and Communication of the Deaf

- User requirements
- Courses for the German SL
- Evaluation and validation

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# The partners



Pompeu Fabra University

Head: Associate Professor Ricardo Marques

- Avatar design
- System Requirements

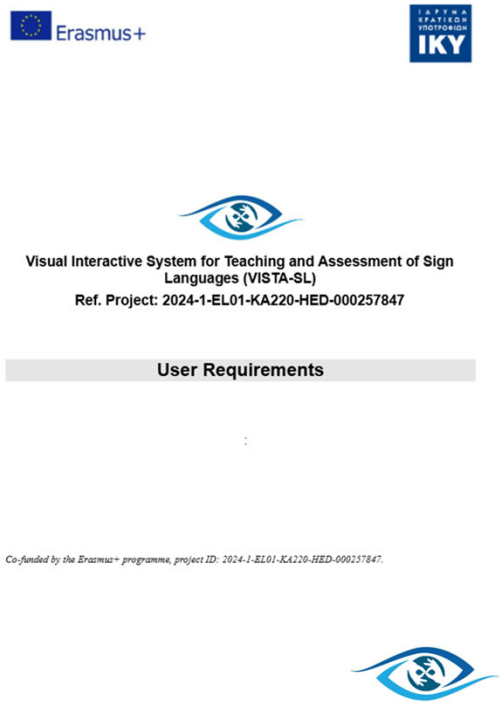
upf. Universitat Pompeu Fabra Barcelona

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# Analysis of the needs

Analysis of Sign Language Teaching Methods and Challenges for an Automated Teaching System.

- Focus groups in four countries
- A research study that extensively analyzes the requirements of system and teaching curricula
- Publicly available through the VISTA-SL website.




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# The learning system

A prototype system that is able to:

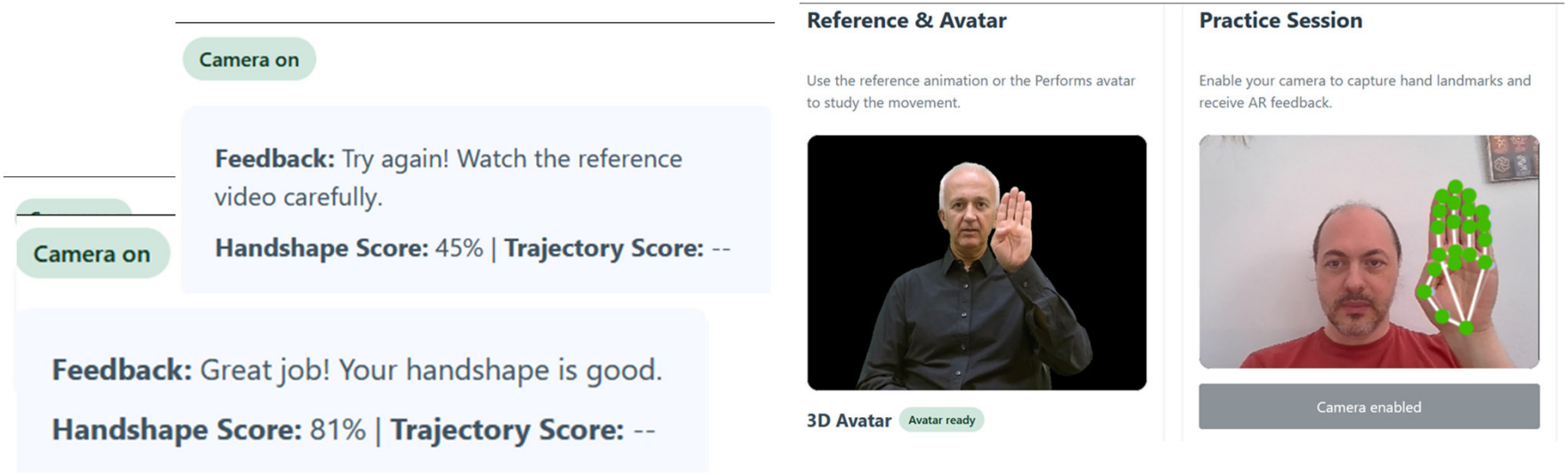
- Present an e-learning environment to the student.
- Support interactive learning with feedback
- Support personalized learning paths





# The learning system (cont.)

- Acquire video of the student signing
- Recognize to what extend the uttered phrases obey the SL morphology
- Highlight possible errors and give feedback




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# The learning system (cont.)

## Reference & Avatar

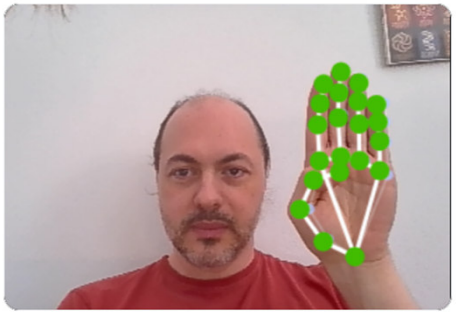
Use the reference animation or the Performs avatar to study the movement.



**3D Avatar** Avatar ready

## Practice Session

Enable your camera to capture hand landmarks and receive AR feedback.



Camera enabled

Camera on

**Feedback:** Waiting for you to practice...

**Handshape Score:** -- | **Trajectory Score:** --

Camera on

**Feedback:** Great job! Your handshape is good.

**Handshape Score:** 81% | **Trajectory Score:** --

Camera on

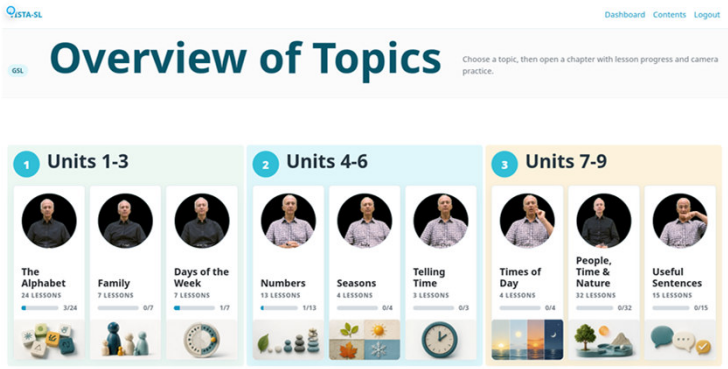
**Feedback:** Try again! Watch the reference video carefully.

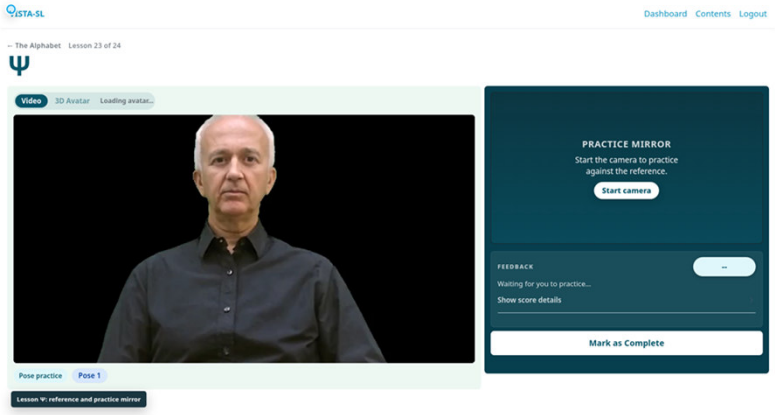
**Handshape Score:** 45% | **Trajectory Score:** --

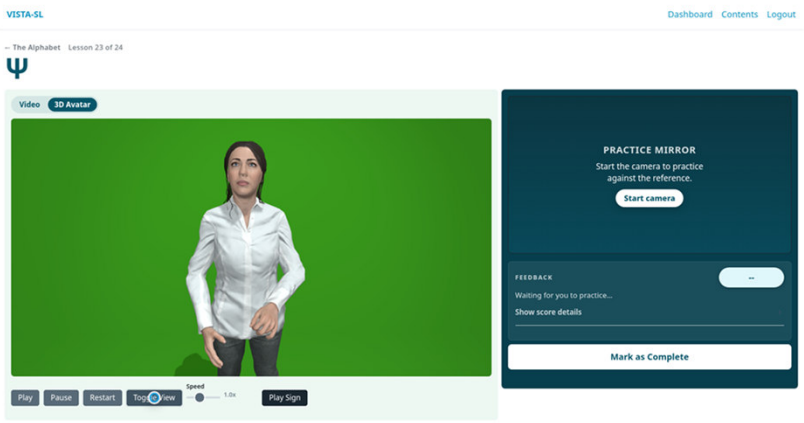
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# The learning system (cont.)




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# The interactive content

- Interactive material in four different sign languages:
  - Greek, Dutch, German, Irish.
- Include theoretical background and practical exercises providing feedback in an interactive way.

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# The interactive content

- Students will acquire basic skills in Sign Language
- Approximately 200 – 500 signs, i.e., the student understands the signs and can respond adequately in Sign Language at a basic level.

# The interactive content (cont.)

- Understand numbers
- Say hello or goodbye
- Understand simple remarks and warnings
- Carry out given tasks in the right order
- Understand simple conversations about family relations, common interactions, etc.
- Dialogues

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# Games and Personalization

- The system will support student personalization
- Leverage the power of Large Language Models
- Interactive games

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# Avatar

- Automatically replicate human motion
- Enable multiple viewpoints / zooming
- Very detailed feedback
- Support personalization



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# ECTS and certification

- CAT-SL will be part of the ECTS system.
  - courses developed for students wanting to become teachers in special education;
  - SL interpreters;
  - any other profession that requires skills in Sign Language.
- Non-university students will receive a certificate after successful completion of the course by the organization that gave the training.
  - The level of the training will be indicated on the certificate.

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# Further information

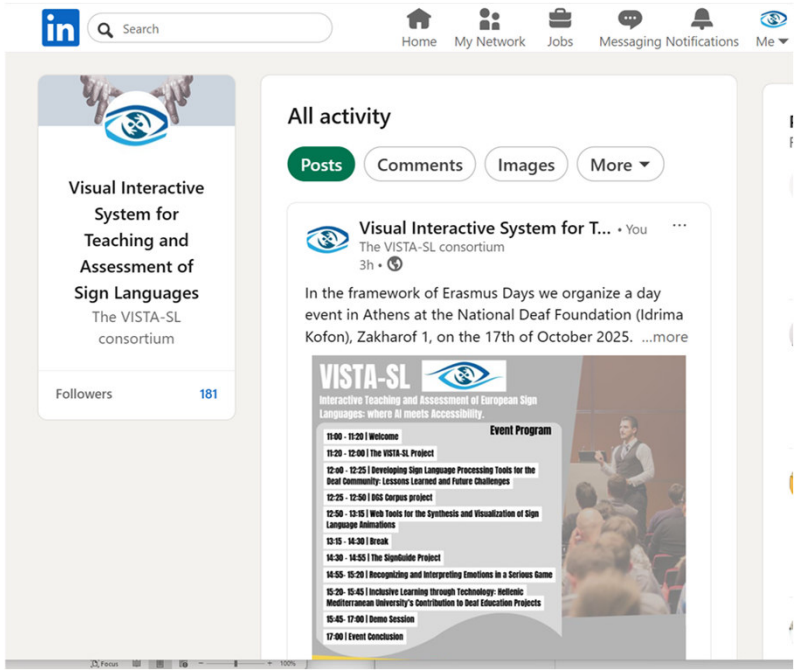
The VISTA-SL project web page: https://vista-sl.eu

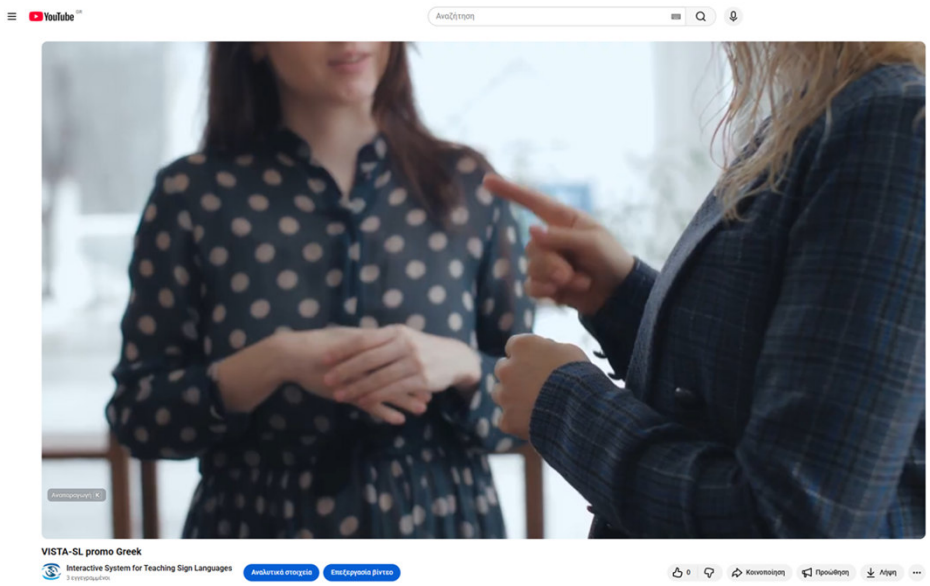



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# Further information

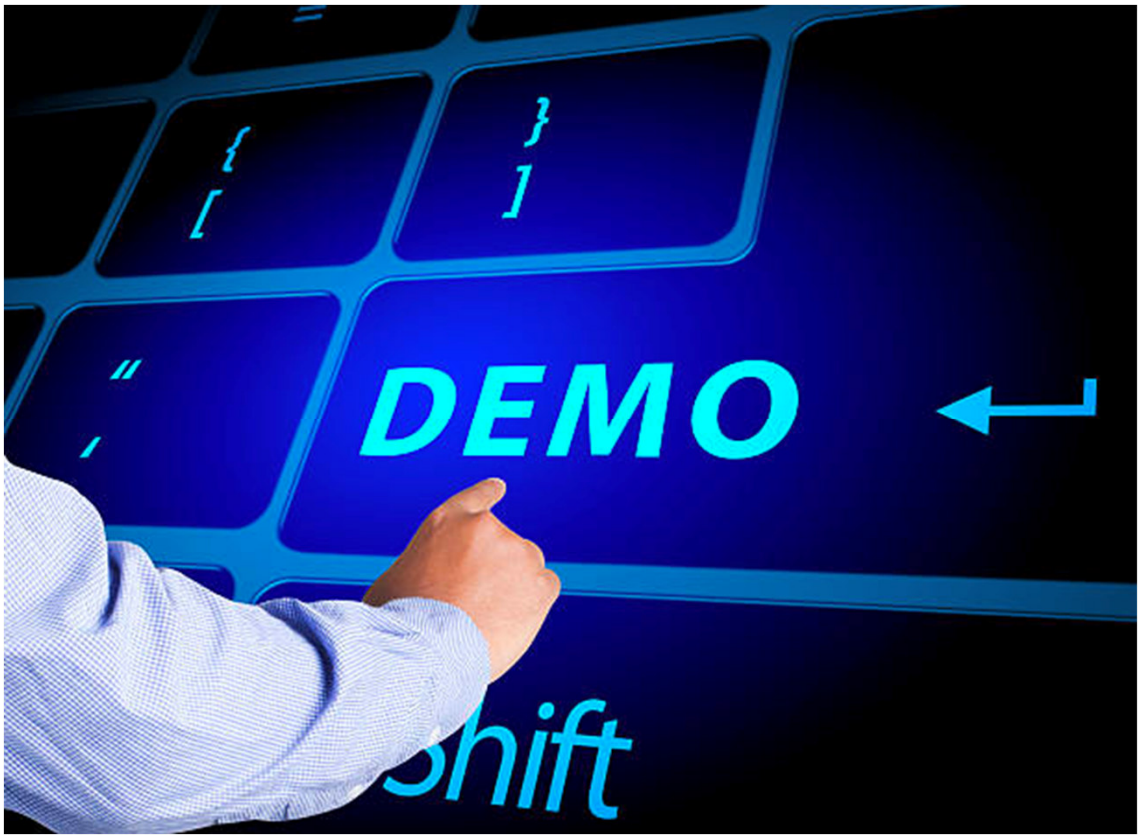
## Social media:




http://www.youtube.com/@VISTA-SL

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Shift

Thank you for your attention

