3D GREEK SIGN LANGUAGE CLASSIFIERS

AS A LEARNING OBJECT IN THE

SL-REDU ONLINE EDUCATION PLATFORM

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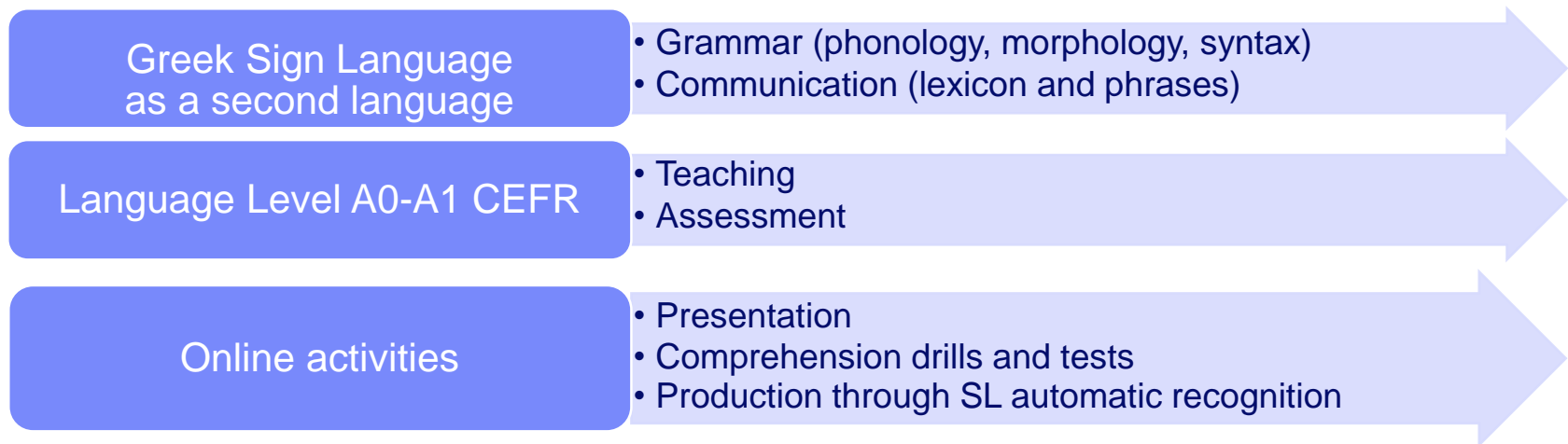*[3]Electrical & Computer Engineering Department, University of Thessaly (GREECE)*

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and New Learning Technologies**

SL-ReDu
Sign Language Recognition in Education

- Language didactics
- Sign linguistics
- SL video corpora
- SL recognition

An innovative project for Greek Sign Language (GSL) as L2 at Tertiary level

Greek Sign Language as a second language
- Grammar (phonology, morphology, syntax)
- Communication (lexicon and phrases)

Language Level A0-A1 CEFR
- Teaching
- Assessment

Online activities
- Presentation
- Comprehension drills and tests
- Production through SL automatic recognition

Challenges of
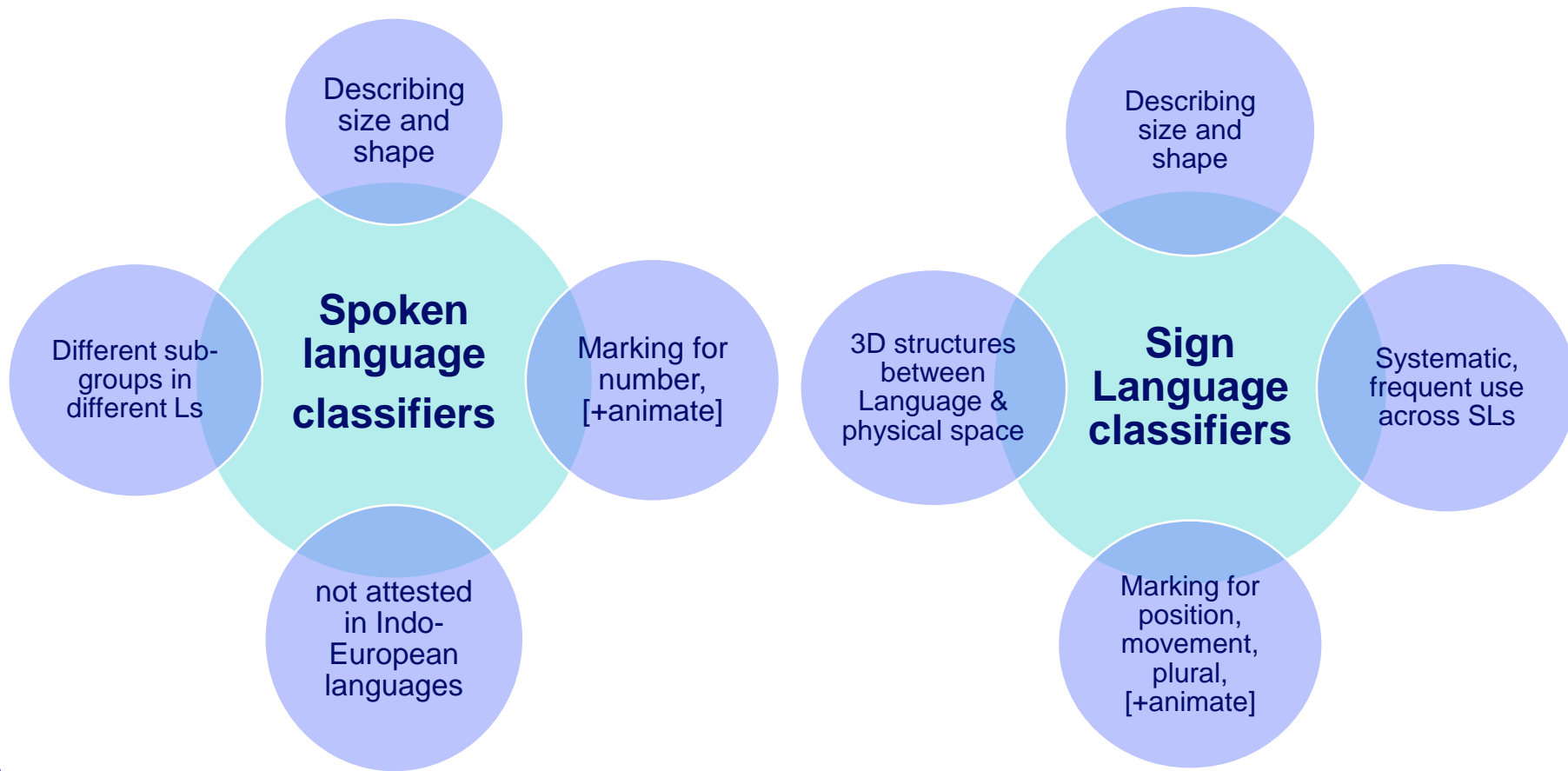# Online Learning of Greek Sign Language

Technical

- Higher technological prerequisites
- Language perception through image and video

- Language production recognition via advanced movement detection technology

Linguistic

- Visual-motor, 3-dimensional L modality

- Low degree of equivalence with spoken Greek in lexical-grammatical level

- Younger research corpora

Classifiers across Languages of the world

Spoken language classifiers

- Describing size and shape
- Different sub-groups in different Ls
- Marking for number, [+animate]
- not attested in Indo-European languages

Sign Language classifiers

- Describing size and shape
- 3D structures between Language & physical space
- Systematic, frequent use across SLs
- Marking for position, movement, plural, [+animate]

Classifiers examples of use in GSL

Indicative functions of GSL classifiers for marking position and orientation of an animate semantic entity, as well as of a two-dimensional and a three-dimensional entity.

FEMALE **CL**2handed[+animate] standing position
Two female persons are standing (indicating exact position and orientation of persons).

BALL **CL**[sphere] falling
A ball is falling (indicating exact position and orientation of the ball, as well as manner of movement).

TABLE PENCIL **CL**[2dimensional] laying horizontally
A pencil is on the table (indicating exact position and orientation of the pencil).

Aim of the SL-ReDu curriculum is to shift the linguistic view point of the students towards the 3D, visual – motor modality of GSL

Subsets of GSL classifiers
per frequency of occurrence in the Dicta Sign GSL corpus

Semantic entity	• 477 occurences
Size and Shape Outline	• 233 occurences
Handling	• 200 occurences
Size and Shape Static	• 129 occurences
Other	• 67 occurences
Bodypart	• *14 occurences*

Subsets of classifiers selected for A0 – A1 levels in SL-ReDu platform

Semantic entity	• 477 occurrences
Size and Shape Outline	• 233 occurrences
Handling	• 200 occurrences
Size and Shape Static	• 129 occurrences
Other	• 67 occurrences
Body part	• 14 occurrences

SL-ReDu platform
Classifier content organisation

Tailored to support a semester undergraduate course of thirteen weeks

Classifier Categories in the Platform

- *Adapted model of a classification as straightforward as possible, for beginner level GSL L2 students*

Animate entity	Physical dimensions	Sizes and shapes	Orientation
Standing position	No-dimension points	Whole small entity outline	Variations in orientation presented with respective images
Standing movement	One-dimension lines	Shape outlines	
Laying position	Two-dimension surfaces		
Animate entity plurals	Three-dimension objects		

Sample exercise of classifier perception (1)

Object dimension exercise

- Video stimuli

- Use of written Greek input is avoided

- Student sees lexical item presented on camera, here: *FISH*, and chooses the appropriate classifier complement

Sample exercise of classifier perception (2)

Ασκήσεις ταξινομητών διαστάσεων

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Plural + Object dimension combined exercise

- Image stimuli

- Use of written Greek input is avoided

- Student sees the target classifier on still image and chooses between different lexical entities that can accept the given classifier form.

Option on the left matches for plural; option on the right matches for dimensions; the middle option is the expected correct response.

Sample exercise of classifier perception (3)

A matching exercise on human entity and object dimension classifiers.

Greek Sign Language recognition in the SL-ReDu platform

- Online autonomous learning

- No limits to number of efforts

- No limits to number of students signed in the course

- Self assessment modules

- Group testing irrespective of number of students

- Objectivity of assessment

- No specialized equipment requirements

Automatic recognition of most frequently occurring handshapes in GSL

Figure 2. Main thirteen handshape configurations of the isolated sign content.

Classifier handshapes included
Automatic recognition of most frequently occurring Classifier handshapes in GSL

H/shape D	H/shape Dj	H/shape Dk	H/shape E	H/shape Eja	H/shape Fc	H/shape Fk

H/shape Hl	H/shape Ij	H/shape Fj5	H/shape O6	H/shape Pa	H/shape N6

The most common classifier handshapes in GSL are among the most common GSL handshapes overall, with the exception of three-dimensional P- and C- handshapes.

Sample exercise of classifier production (1)

Ασκήσεις ταξινομητών διαστάσεων

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Ἀνοιγμα Κάμερας Υποβολή Απάντησης

0:00

Object dimension exercise

- Image stimuli

- Use of written Greek input is avoided

- Student activates camera, signs and submits response

Sample video exercise of classifier production (2)

Object dimension exercise

- Video stimuli

- Lexical stimuli for a classifier production response

- Student activates camera, signs and submits response

Conclusions

SL-ReDu Classifier curriculum	applies innovative tools necessary for GSL L2-M2 students	to classify linguistic entities on the basis of their geometrical properties	thus changing their viewpoint of Language

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T H A N K   Y O U !

Questions? Please contact:
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Acknowledgments