A Tool Developed for Assisted Communication with Deaf Students

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Barriers faced by deaf students in education

- Language barriers to fluent communication
- Experiential shortages
- Social concerns
- Curriculum and instruction
- Lack of resources
- Limited access to information.
I–ACE project

- EU Erasmus + Strategic Partnership action started
- Nov 1, 2016 and completed Dec 31, 2018
- Coordinator of the project:
  - Instituto Politecnico do Porto
- Participating organizations: Universitaet Siegen, Germany, European Association of Career Guidance, Cyprus, Technological Education Institute of Crete, Greece, Univerza V Mariborou, Slovenia, University of York, UK
I–ACE project’s motivations

- Natural language barriers to fluent communication between deaf/non-deaf, international cooperation
- Negative impact on the learning and mobility of deaf students which generates discrimination
- Inclusive school, equity and equal opportunities.
I–ACE project’s aims

- Promote equity and social inclusion
- Boost mobility of deaf students.
Methodology

- VirtualSign translator of sign language: Portuguese
- Create translation models to EU languages
- Slovenian, English, Greek/Cypriot and German
- Train staff in partner institutions
- Transfer of research results to society
- Load sign language dictionary for the new languages
Sign languages characteristics

- Sign languages are distinct from oral languages.
- Linguistic features are different
- The first language of deaf people is sign language
- Their country oral language is a second language, like English for most of us
- Despite being able to read in our native language we cannot read English without training
- The same happens to deaf people that cannot read Portuguese because their native language is Portuguese Sign Language, not Portuguese.
Components of sign languages:

- Hand configuration
- Point of articulation
- Hand movement
- Body movement
- Facial expression.
Sign languages characteristics

- Hand Shape
- Palm orientation
Sign languages characteristics

- Body movement
- Facial expression
Hearing impaired people in Greece

- 25,000 deaf/hearing aid people and about 40,000 with residual hearing
- Communication difficulties with the rest of the world
- Isolation of people with hearing problems
- Mediocre quality of everyday life
- Increased rate of abandoning their studies
- Increased rate of unemployment.
Greek application of the I–ACE project

- Adaption of the automatic bi-directional sign language translator to Greek sign language

Virtual Sign tools

Translator

Configurator
Incorporating new languages

In 2018

- Portuguese and Brazilian Portuguese (LIBRAS)
- Slovenian
- Greek/Cypriot
- German
- English
3D Avatar

Grammatical parsing
Term- animation matching

Text
Greek application for the I-ACE project

- Import of the selected hand configurations in the system
Greek application for the I–ACE project

- Naming configurations
Greek application for the I-ACE project

- Entering the words

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Noun

path, route, itinerary
An established line of travel or access
road, route, bridleway
An open way (generally public) for travel or transportation
freeway, motorway, state highway, route
A broad highway designed for high-speed traffic
line, route
Regular operation of a particular path for a type of transportation (rail line, bus line, aircraft line)

Route (command)
In computing, route is a command used to view and manipulate the IP routing table in both Unix-like and Microsoft Windows operating systems.

Route (gridiron football), passing route
A route is a pattern or path that a receiver in American football and Canadian football runs to get open for a forward pass.
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Greek contribution

- Total number of inserted words: 605
- Total number of validated words: 605
- Greek model used as the basis for Cypriot model as well.
I–ACE project core activities

Heraklion focus group

- Desk research and online surveys
- Meetings with deaf people
- Presentation of Mr Kornarakis’s thesis titled “3D AVATAR AND I–ACE IN THE SERVICE OF THE DEAF PEOPLE”
- TV, radio, newspapers and news websites highlighted the significance of the focus group.

Heraklion focus group

MSc thesis presentation

Focus group participants
I–ACE project core activities

Pilot installation of the European sign language translator in the special primary school

- Presentation of “John”, the 3D avatar
- Tic–Tac–Toe game
- Hands–on session (teachers’ and students’ training)
- Assessment of the I–ACE project.
Pilot installation

Teachers and students training
I–ACE assessment

- Participants
  - Six Deaf students
  - Four sign language teachers

- Average age: 19.4 years.
## Results

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Deaf students</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>Sign language teachers</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>19,40</td>
</tr>
<tr>
<td><strong>Usefulness</strong></td>
<td>100%</td>
</tr>
<tr>
<td><strong>Understandability</strong></td>
<td>90%</td>
</tr>
<tr>
<td><strong>Speed</strong></td>
<td>90%</td>
</tr>
<tr>
<td><strong>At home</strong></td>
<td>100%</td>
</tr>
<tr>
<td><strong>At school</strong></td>
<td>100%</td>
</tr>
<tr>
<td><strong>Willingness to participate in similar projects</strong></td>
<td>30%</td>
</tr>
</tbody>
</table>
## Improvement suggestions

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Facial expression</td>
</tr>
<tr>
<td>2</td>
<td>Facial expression</td>
</tr>
<tr>
<td>3</td>
<td>More colours</td>
</tr>
<tr>
<td>4</td>
<td>Body movement</td>
</tr>
<tr>
<td>5</td>
<td>Facial expression, body movement</td>
</tr>
<tr>
<td>6</td>
<td>Slightly slower speed</td>
</tr>
<tr>
<td>7</td>
<td>Speed, facial expression, clearer movement</td>
</tr>
<tr>
<td>8</td>
<td>Speed, facial expression, movement</td>
</tr>
<tr>
<td>9</td>
<td>Facial expression</td>
</tr>
<tr>
<td>10</td>
<td>Speed, facial expression, better application, 3D presentation</td>
</tr>
</tbody>
</table>
Thank you!