Sign Language Tutor

Digital improvement for deaf and hard of hearing people

Deaf People Community

- *"Deaf and hard of hearing people do not identify as having a disability or see themselves as experiencing a limitation. Instead, they identify as a member of a cultural and linguistic group."*

- Problem with the hearing people to enter this cultural and linguistic group.

Deaf People Community

- Over 275 million people globally with moderate-to-profound hearing impairment

- Sign Languages a way to exchange information within these communities

- Deaf and hard of hearing children attending schools using an oral approach rarely acquire sufficient lip-reading skills

Deaf People Community

- In Macedonia there are around 6000 deaf people
- Small number of licensed interpreters of the Macedonian Sign Language
- Poor online information about MSL
- Since six months ago – the alphabet became online available

Deaf People Community

- Out biggest challenges:

  o Finding information about MSL

  o Contacting with deaf and hard-of-hearing community in Macedonia

Macedonian Sign Language

- Two versions
  - Signed with one hand
  - Signed with two hands
- Hands in combination with head, mouth and body movement and facial expression
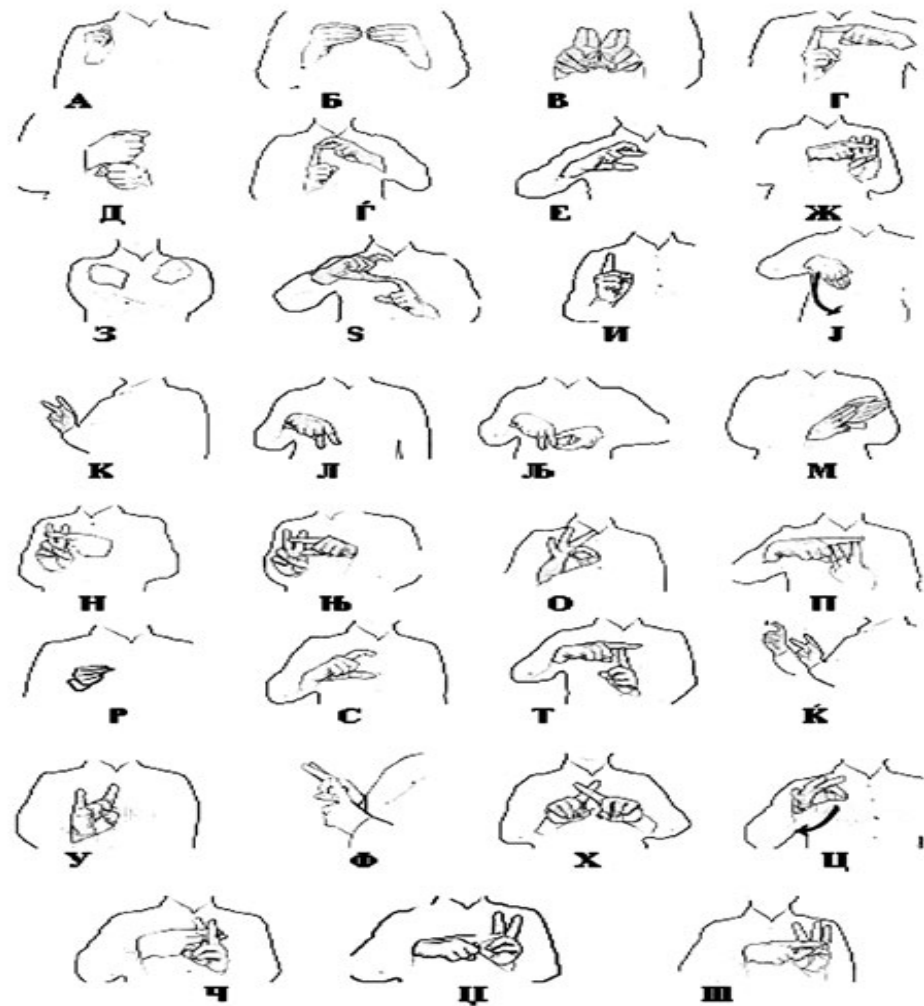
Technical research

- Digital technology as a tool to reduce the gap between deaf and hard of hearing people with the rest of the population
- Visual technology improvements
  - Translate sign language into text and reverse
  - Digital learning process of SL
 - Illustrated dictionaries, learning games and quizzes.

XNA Framework

- Programming visualization tool
- Set of assemblies for working with images, audio, video and 3D content
- Microsoft C# programming language
- Also tool for todays modern games on Xbox 360, Windows Mobile and Desktop

Sign Language Tutor

- Platform for interactive 2D and 3D games
- Learning visual content for the Macedonian Sign Language.
- 2D Games Memory and Explore good for learning and increase of mental and memory skills
- Simulator for 3D animation learning of the alphabet and particular words.

Application Technical Side
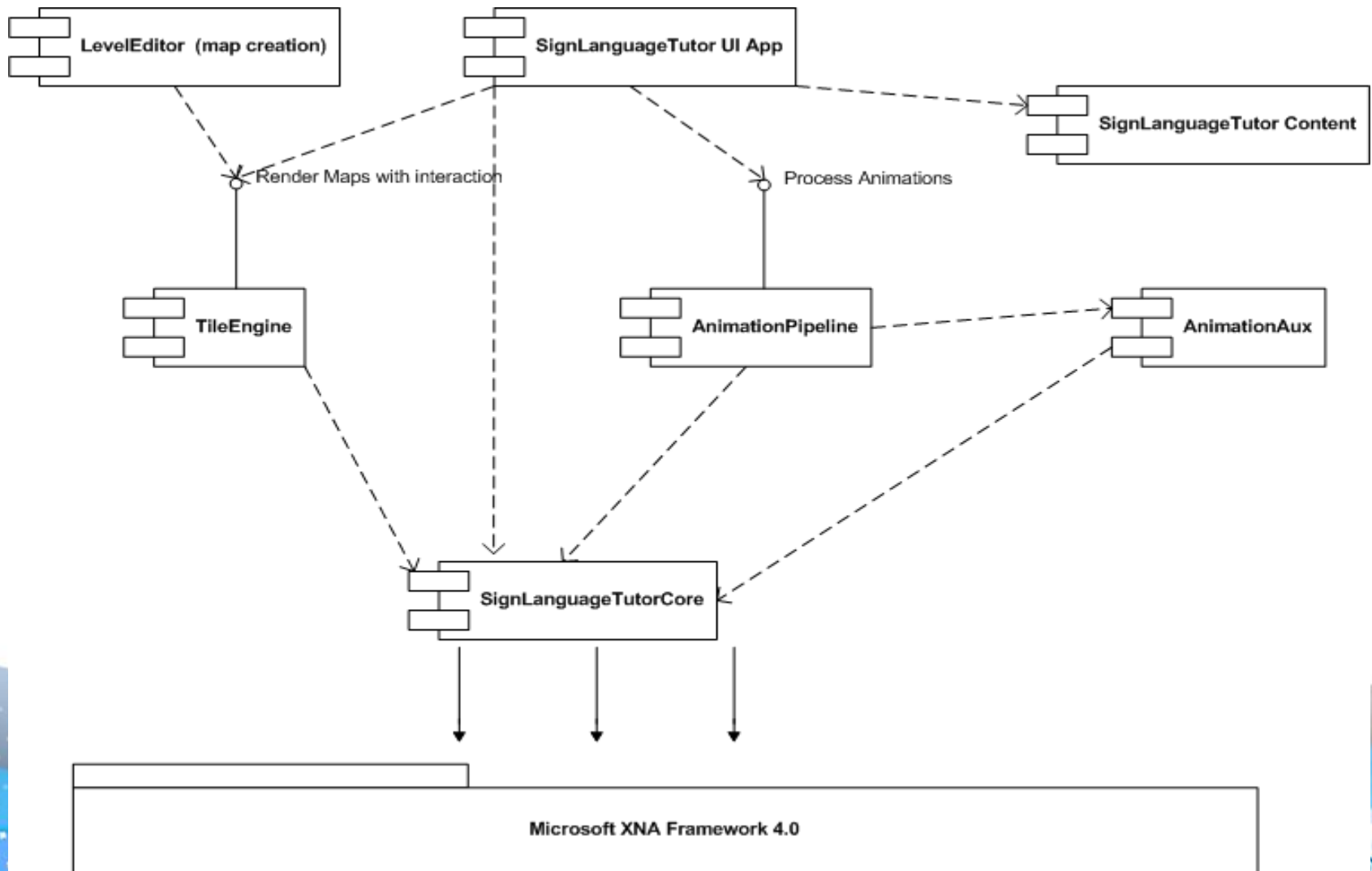
Animation Processor

- Extension of the XNA Content processor for animation support of 3D skinned models

- Process Steps
  - Process skeleton (create bones tree hierarchy for interactive bones purpose)
  - Process Material for the object with effects
  - Process animations, create animation clips with key frames and duration

Some App screen shots

Application usage

- Target group is everyone who wants to learn the MSL (specially for children)
  - Deaf and hard of hearing people
  - Hearing people
- Learning a Sign language visually
- Games and visual content, best way for fast learning. (learn the fun way)

Current Work

- Application Testing
  - Negotiating with the institution for deaf and hard of hearing "Partenija Zografski" in order to test the system on a referent number of children
  - Other?? Suggestions?

- Improvements
  - Enrich the dictionary with more words and phrases

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Future Work

- Explore possibilities of automatically signing text in MSL with usage of software patterns

- Manipulation of 3D model skeleton

  - Dynamic animations and transformation of model bones based on patters

  - Possibility to sign whole sentences in MSL from written text with dynamic animations

About

- **Q&A**
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