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AI4KSL
Bridging Language Barrier With AI

AI4KSL: Bridging Language Barrier using Artificial Intelligence for Kenyan Sign Language among Deaf Learners

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Overview

This project seeks to develop an assistive Artificial Intelligence technology for Kenyan Sign Language.

Goal: to have an assistive AI technology that converts spoken English to Kenyan Sign Language and have visual representation of the signs using virtual signing characters (Avatar) in real time.

OBJECTIVES
- Build dataset for spoken English and video recorded Kenyan Sign Language
- Develop a prototype assistive AI technology from spoken and written text to KSL
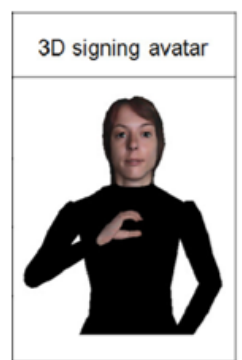- Evaluation of the assistive AI technology

Methodology

Figure 1: AI4KSL methodology

Target

- 70 sign language teacher trainees (students), 16 teachers of hearing impaired learners and 1000 learners with hearing impairment.
- About 10,000 words and sentences (as per KICD curriculum)
- 30,000 video-clips of Kenyan Sign Language using by at least 3 persons).

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PUT THIS BOOK ON THAT TABLE	TABLE THAT BOOK THIS PUT//
PUT THIS BOOK ON THAT TABLE	TABLE THAT BOOK THIS ON PUT//
A CHEETER RUNS FAST	CHEETER FAST RUN//
A CHEETER RUNS FAST	CHEETER RUN FAST//
A FOUL SMELL EMANATED FROM THE MORTUARY	MORTUARY SMELL FOUL EMANATE//
A FOUL SMELL EMANATED FROM THE MORTUARY	PAST MORTUARY THERE SMELL FOUL EMANATE//
A FOUL SMELL ENAMATED FROM THE MORTUARY	PAST SMELL FOUL MORTUARY EMANATE//

Figure 2: Example sentences and corresponding gloss

Results

- 4600 words
- 5900 sentences (Glossed)
- about 20,000 video clips
- Ongoing Video segmentation using ELAN [1]
- Ongoing Text transcription using HamNoSys notation [2]

Challenges

- Sign variation
- Glossing variation (focus on meaning)
- Dataset publication - Data Anonymization

References:
1 - ELAN https://archive.mpi.nl/tla/elan
2 - Hanke, T. (2010). HamNoSys–hamburg notation system for sign languages. Institute of German Sign Language, Accessed in, 7.
3 - Elliott, R., Glauert, J. R., Jennings, V., & Kennaway, J. R. (2004, May). An overview of the SiGML notation and SiGMLSigning software system. In Fourth International Conference on Language Resources and Evaluation, LREC (pp. 98-104).article/10.1007/ s10209-007-0102-z