

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

	1: Data	collection	2: Transcription: p	phonetic-level rep	presentation	3: Animation
ENGLISH	KSL	DESCRIPTION	Demonstrator	Sign notation in HamNoSy	s:∋ro∀°	3D signing avatar
That is an	ANIMAL THAT	ANIMAL: Two claw hand				
animal		forms in front of the signer,		Hand shape	9	60
		moves in circular movement one after the other.	U	Hand orientation	r 0	a la construction de la construc
	N	THAT: One index finger in	F	Location	₩.	
	ĺ	front of the signer with single movement in space away from the signer.		Motion type		
Word/sentence (Text, Voice & Videos)			Hambu	irg Notation Syste (HamNoSys)	HamNoSys to Signing Gesture Mark-up Language (SiGML) to 3D	
iaure 1: Al4K	SL methodology	,				rendering

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).

Results

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

BOOK THIS TABLE PU
TABLE THAT BOOK TH
TABLE THAT BOOK TH
CHEETER FAST RUN//
CHEETER RUN FAST//

лт// HIS PUT// HIS ON PUT//

A FOUL SMELL EMANATED FROM THE MORTUARY MORTUARY SMELL FOUL EMANATE// PAST MORTUARY THERE SMELL FOUL EMANATE// A FOUL SMELL EMANATED FROM THE MORTUARY A FOUL SMELL ENAMATED FROM THE MORTUARY PAST SMELL FOUL MORTUARY EMANATE//

Figure 2: Example sentences and corresponding gloss

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



ARTIFICIAL INTELLIGENCE FOR DEVELOPMENT AFRICA



Canada



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

