SIGN2VOICE

# Our team



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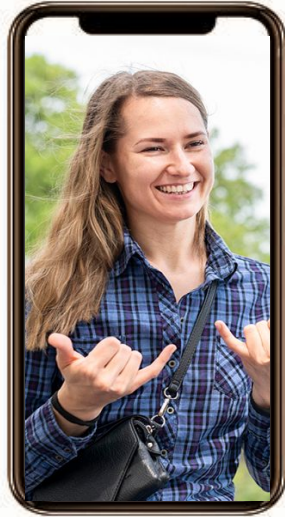# Lost in translation
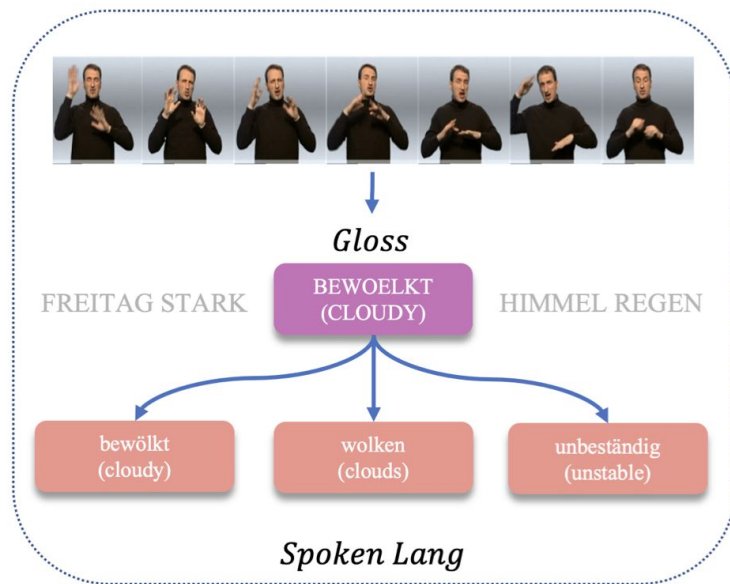
ca. 80,000

< 1,000

# Giving the unheard a voice

With **Sign2Voice** we offer **sign language video to audio translation** to to enable everyone to interact with sign language

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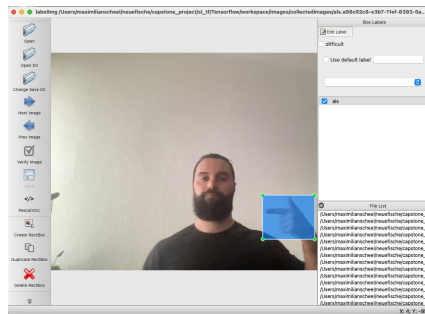# What the hand ...





Gloss

FREITAG STARK    BEWOELKT (CLOUDY)    HIMMEL REGEN

bewölkt (cloudy)    wolken (clouds)    unbeständig (unstable)

Spoken Lang

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# ... and the complexity of sign language processing



SLR   +   G2T   +   TTS

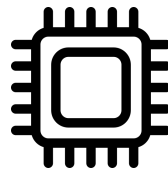SIGN2VOICE

# SLR - identifying glosses
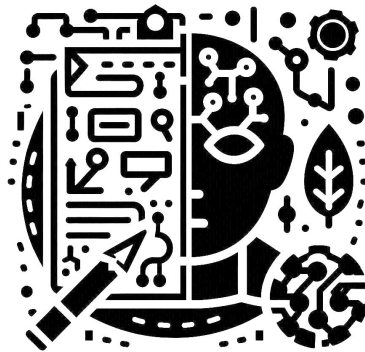


tensorflow

create          train          test

# G2T - making sense of glosses

**Gloss2Text**



**Multilingual LLM**



**Paraphrasing & back translation**



**Semantic relationships**

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# Sign Language Translation (G2T)

**Gloss2Text**

To improve the translation of glosses into text our model uses

- **NNLB-200 - a Large Language Model (LLM)** pre-trained on expansive and diverse corpora
- **tailored data augmentation techniques** like paraphrasing & back translation
- fine-tuning through **semantically aware label smoothing techniques (SALS)** on the target dataset, based on the semantic relationships between the classes

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# TTS - turn text into audio
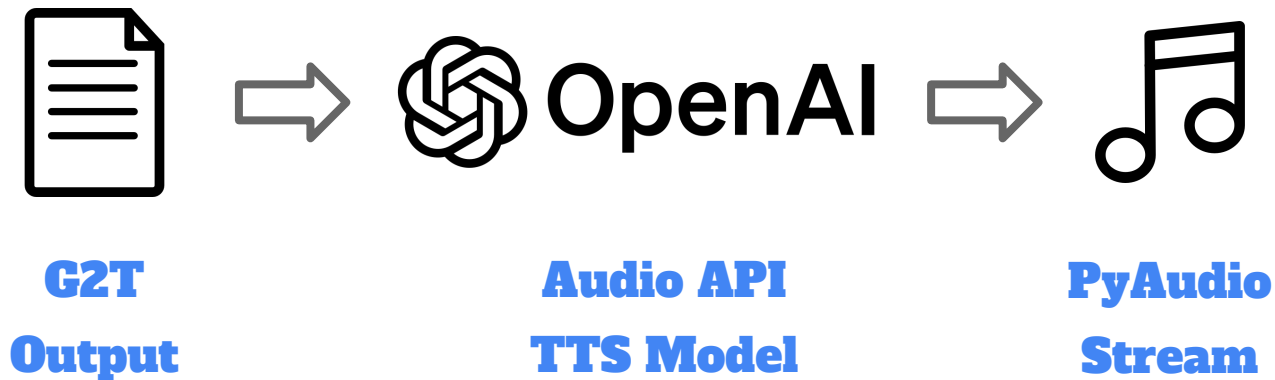
# TIME FOR A DEMO

# tensorflow - WER at confidence 0.65

## 1 of 9 = ca. 11 % error rate

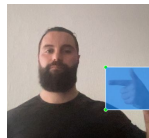| montag | auch | mehr | wolke | als | sonne | ueberwiegend | regen | gewitter |
|--------|------|------|-------|-----|-------|--------------|-------|----------|

Detected Glosses:

montag
auch
mehr
wolke
als
sonne
ueberwiegend
regen

Processing glosses to text

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# tensorflow - limitations

**1**    **spatial context**
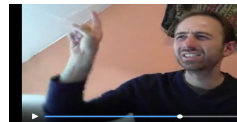**(body, facial expression)**



**2**    **timing context**



**3**    **gloss differentiation**



als du        Gewitter

**3**    **training data quality & generalisability**
**(hardware setup, variety of signers, ...)**

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# How to improve sign2voice



**1**    **ACCURACY**      Improve the model pipeline

**2**    **SPEED**      Increase the processing speed

**3**    **USABILITY**      Add additional app features


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# References

- CORRNET:
  - [CorrNet GitHub Repo](#)
- GLOSS2TEXT:
  - [Gloss2Text GitHub Repo](#)
- TTS:
  - [OpenAI TTS Documentation](#)
  - [ReallyEasyAI GitHub Repo](#)

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