



HearAI: Where AI Supports Inclusion of Deaf and Hearing-Impaired Individuals

**Sylwia Majchrowska, Marta Plantykov
and Milena Olech**



**Towards Diversity, Equity and
Inclusion (DEI) in AI Research**



www.womeninai.co/wailabs



23th of July 2022



Vienna



Agenda

- Presenters
- Motivation & Goals
- Collected Data
- HamNoSys annotations
- Our solution
- Challenges
- Takeaway message
- Project & Team
- Sponsors





Presenters



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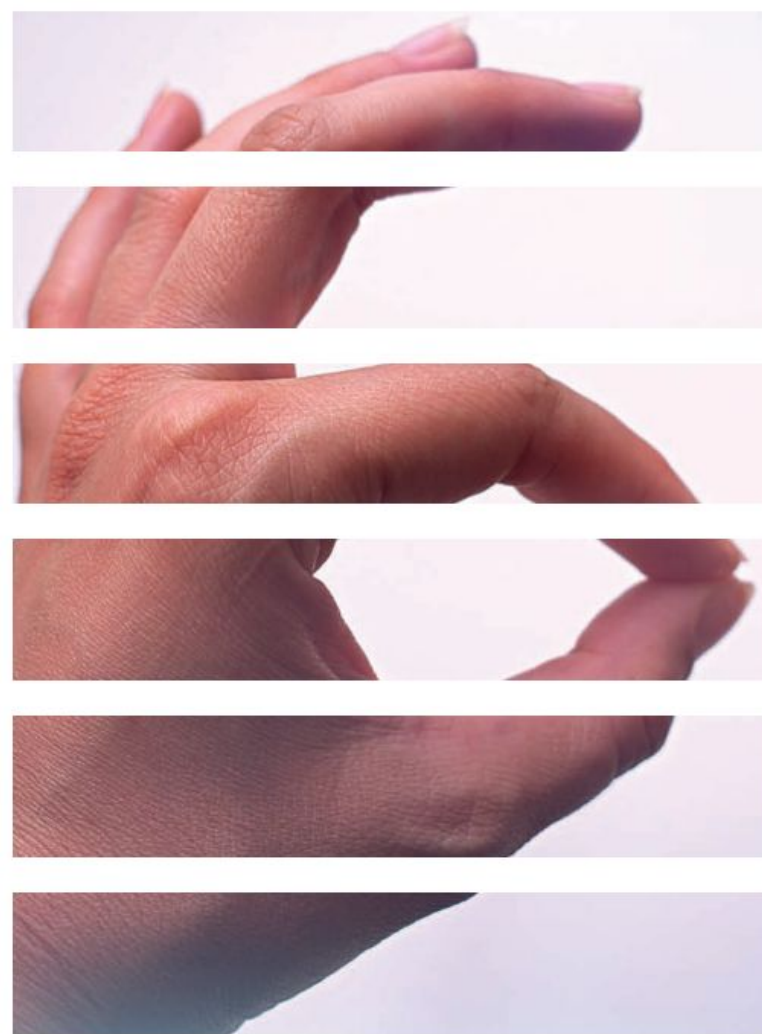
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Motivation

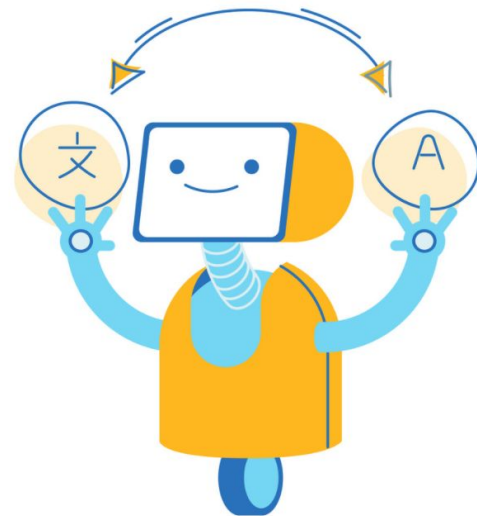
- Deaf belongs to one of excluded social groups
- Deaf cannot benefit from the services of an interpreter when contacting with doctor (also in the hospital), social worker, teacher, policeman, psychologist
- Sign language is different compared to Polish; Deaf learns it as a foreign language
- Due to that Deaf have limited access to information, communicators and entertainment in their native language.





Goal

- To help Deaf affected by all forms of exclusion by:
 - creating a “translator”
 - increasing existing knowledge base
 - increasing public awareness
- Knowledge sharing
- Networking





Collected data

- There is no universal Sign Language
- Collecting data to model Sign Language with Machine Learning was the **most challenging** part of the project
- In general, **more than 30** datasets were considered
- Ultimately selected datasets:
 - Basic Lexicon
 - Galex
 - Glex
 - GSLL
 - PJM Corpus

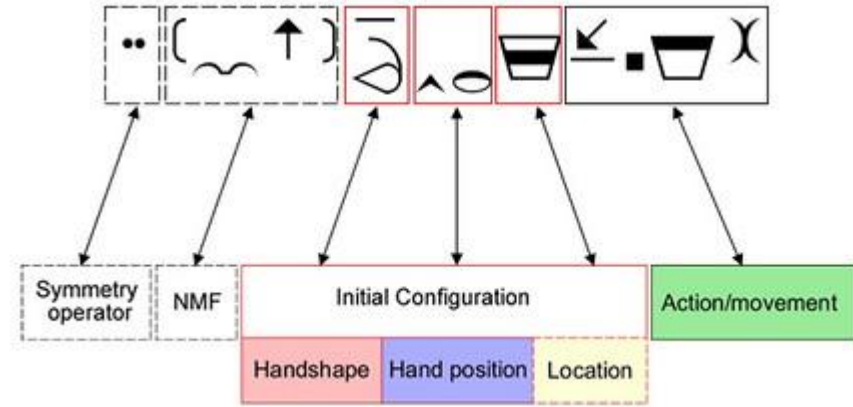


Notation system

Solution that works with the Hamburg Notation System for Sign Languages.

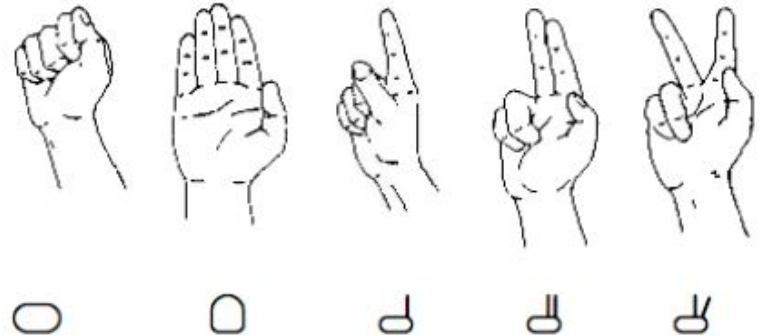
HamNoSys

- developed by a group of hearing and deaf people
- designed to be applicable to **every sign language** in the world
- about 200 symbols (handshape, hand configuration, location and movement)
- designed as “phonemic” notation



HamNoSys

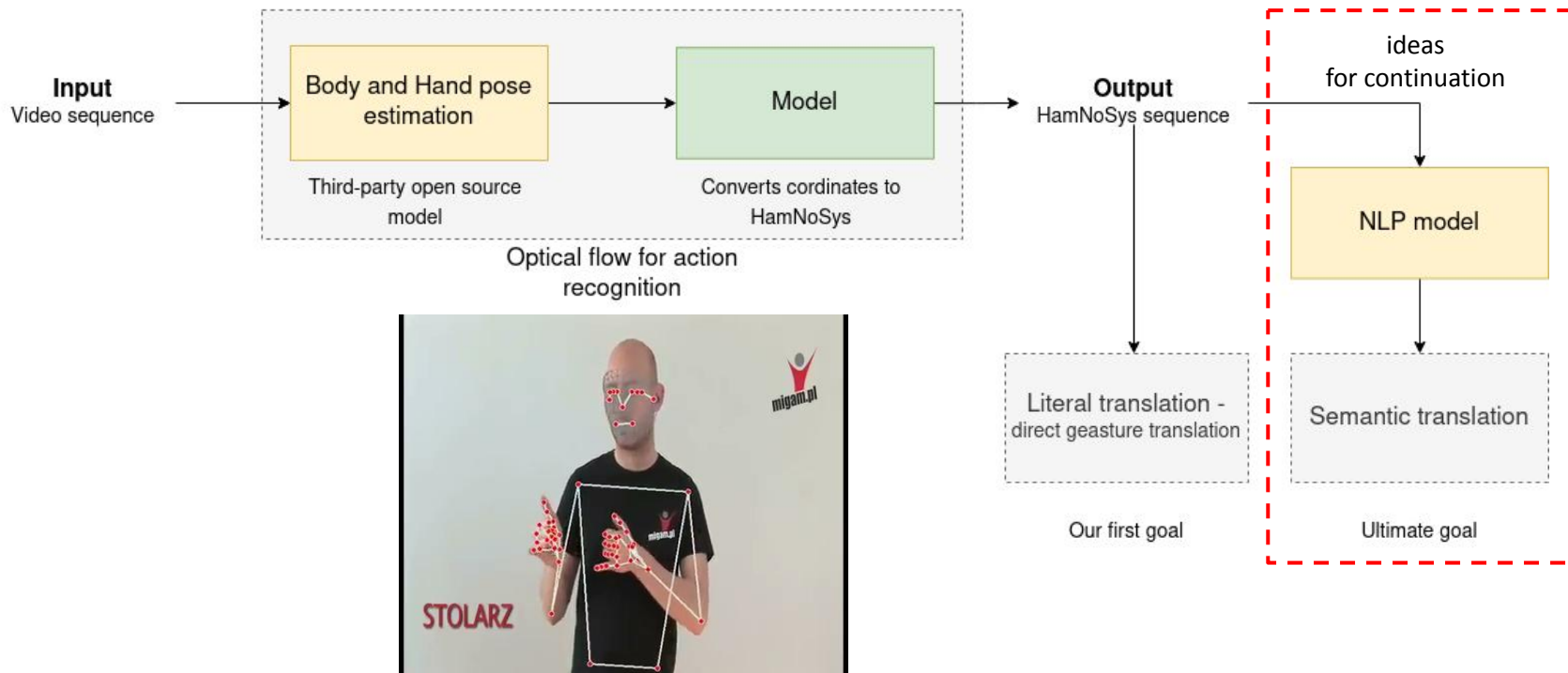
a detailed scientific notation





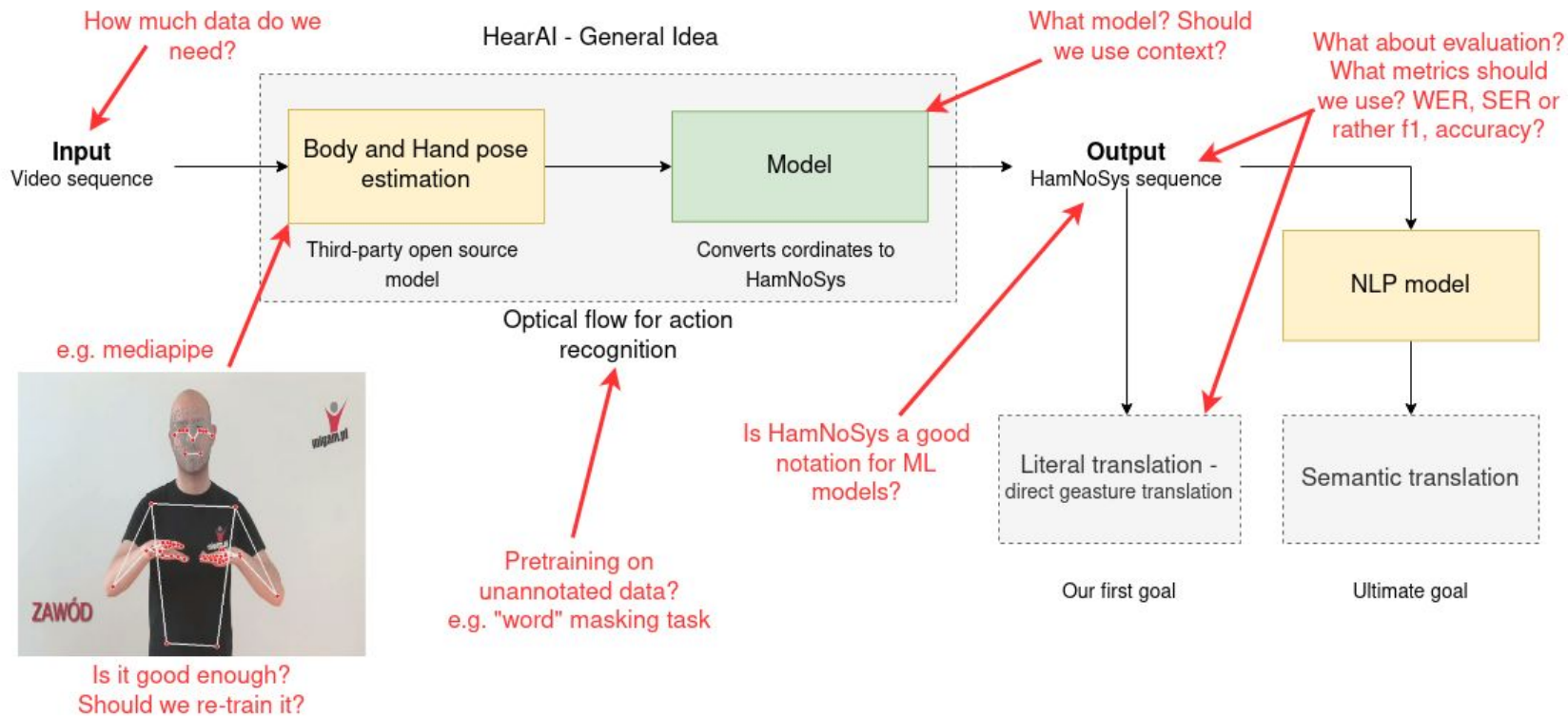
Proposed pipeline

HearAI - General Idea





Challenges

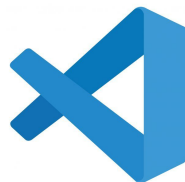
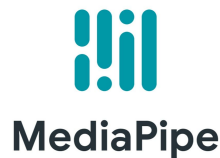




Takeaway message

- HearAI is a local Polish **bottom-up volunteering** initiative
- Project main purpose was to tackle the **automatic sign language translation problem** and **increase awareness**
- Solutions created by the HearAI team are published as an **open source**
- During 5 months 18 volunteers and 6 mentors spend over **2000 man hours** working on the project
- The team still works together on a publication

#AIforGood





ML Engineers

organizers

Team

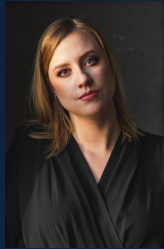
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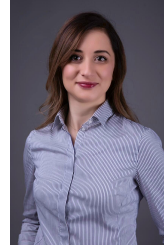
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Anna
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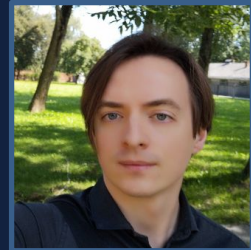
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Ferlin



Wiktor
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Grzegorz
Goryl



Patryk
Radzki



Agnieszka
Kamińska



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Jakub
Nalepa



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Sowa



Karol
Majek



Alicja
Kwaśniewska



Krzysztof
Bork-Ceszlak





Project Partners

VoiceLab



Digital
Innovation
Hub



intel®

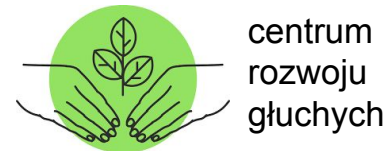


 PFR Fundacja



 **GRAPHCORE**

 **szostek_bar** i partnerzy





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Answering for needs

- It is a must to recognize the right of the deaf people to communicate in the way that is the best for them. Every deaf person must choose his own way by himself.
- Solution – a questionnaire and additional research, which of main goal is to aim described needs
 - First step – interview
 - Second step - questionnaire





Timeline

Working on data

