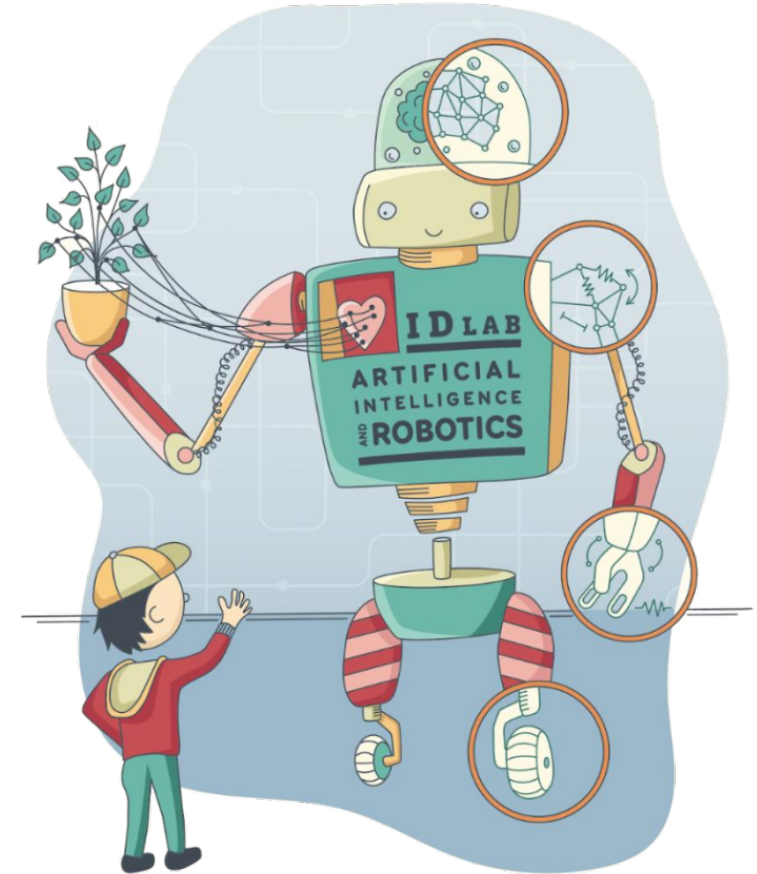# What's that sign?

Mathieu De Coster

IDLab Ghent, AI and Robotics lab

46%

of the Belgian population is **digitally vulnerable**
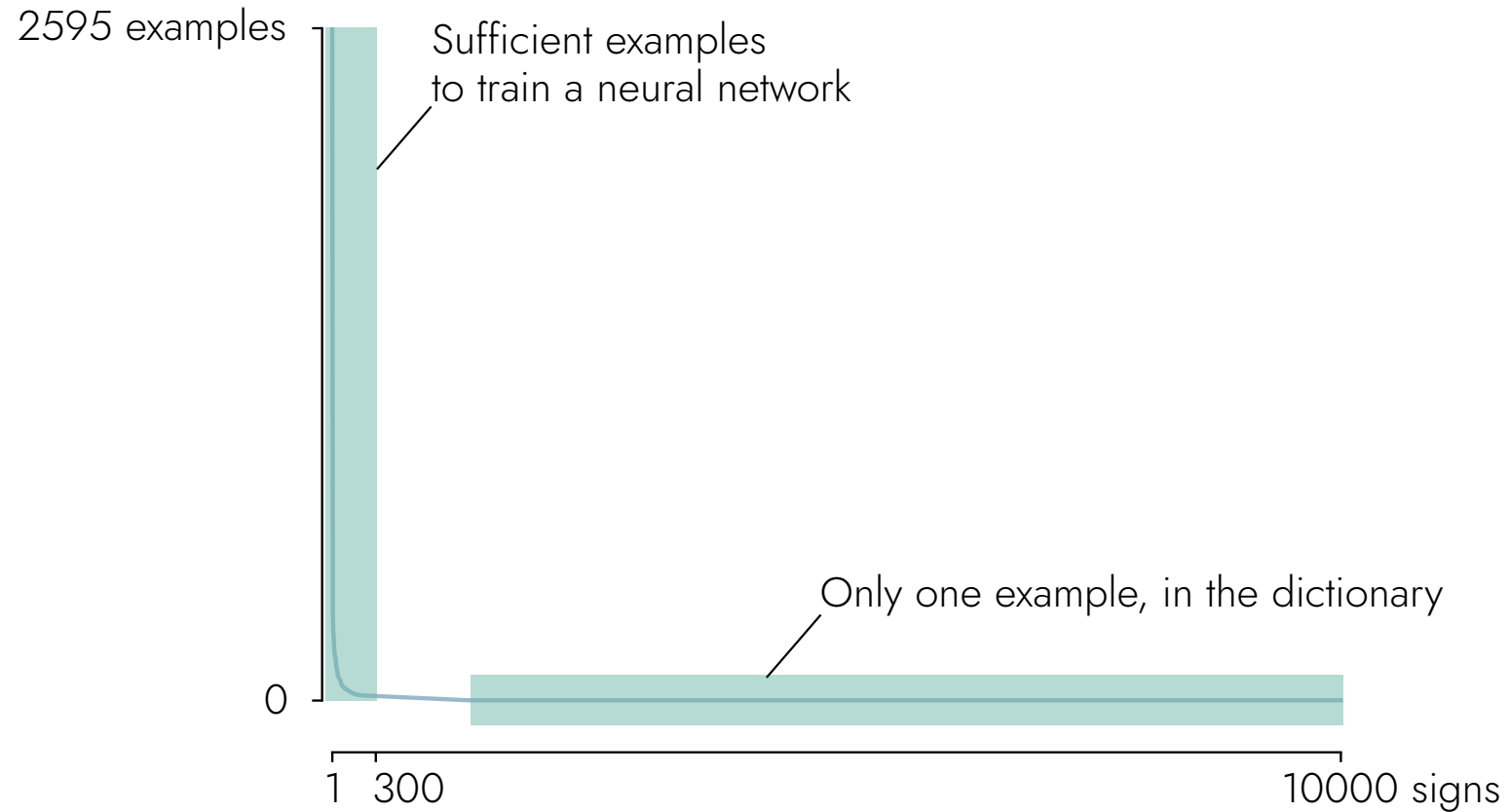
What's that sign?

The web is not accessible
in sign language form

We need to classify unknown signs

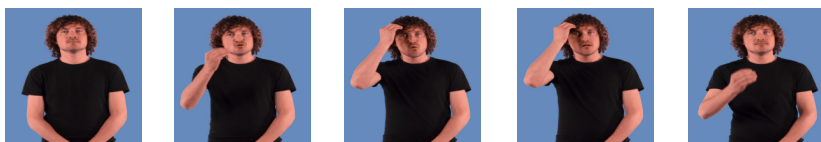We need a robust deep learning system

We made an initial prototype

One shot sign language recognition classifies unknown signs

2595 examples

Sufficient examples
to train a neural network

Only one example, in the dictionary

0

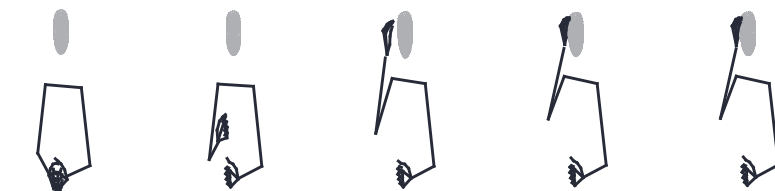1 300   10000 signs

Human keypoint estimation and self-attention enable one shot sign language recognition
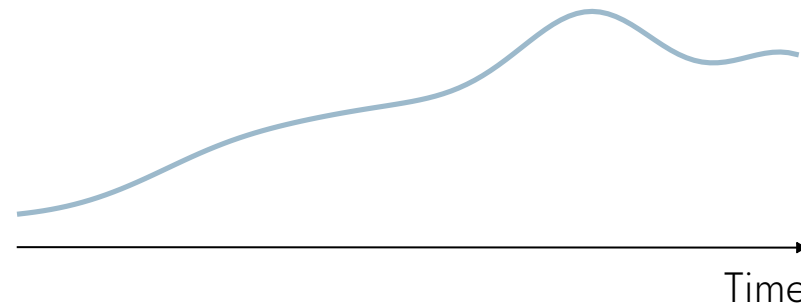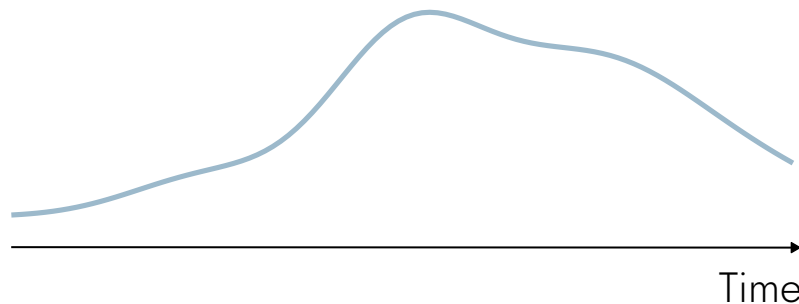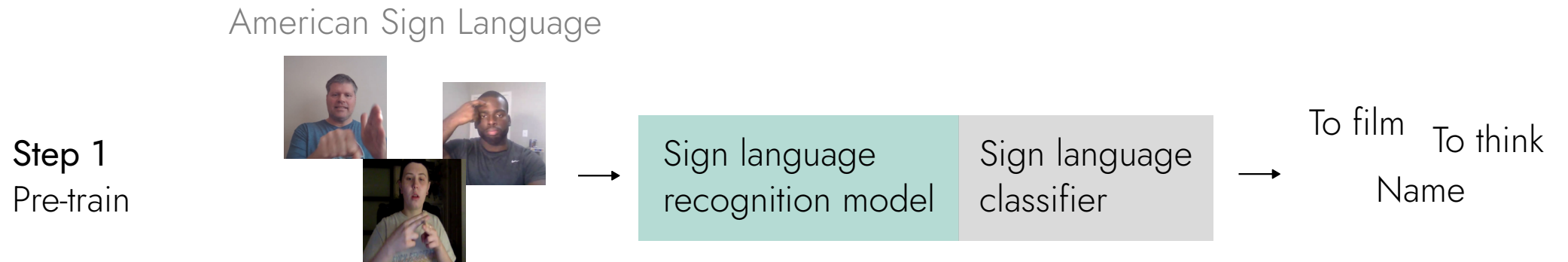

Video frames

Keypoints

Attention

Time

"School"

Time

"To remember"

Queries are classified by finding the nearest neighbour in an embedding space

American Sign Language

Step 1
Pre-train

→ | Sign language recognition model | Sign language classifier | →
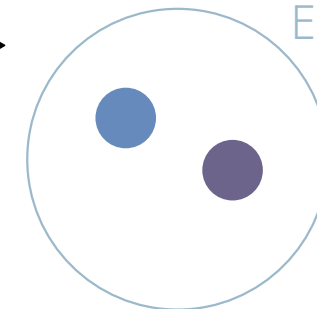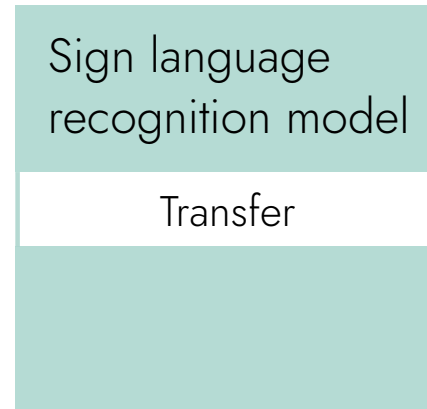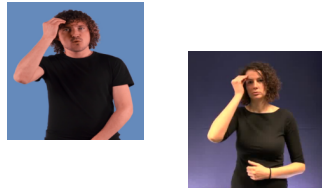
To film   To think
Name

Queries are classified by finding the nearest neighbour in an embedding space

Step 1
Pre-train

Step 2
Embed

Flemish Sign Language
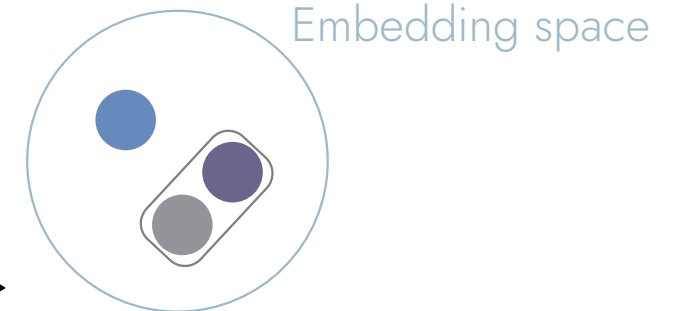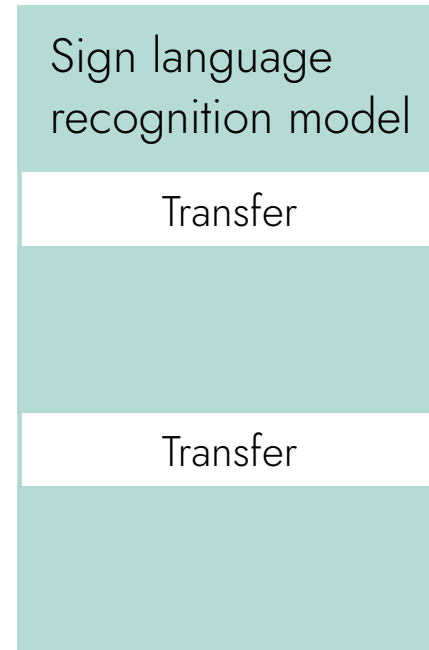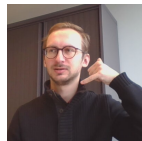
Sign language recognition model

Transfer

Embedding space

Queries are classified by finding the nearest neighbour in an embedding space

Step 1
Pre-train

Step 2
Embed

Step 3
Query

Sign language recognition model

Transfer

Transfer

Embedding space

The reciprocal rank (RR) indicates how accurate the search is

Correct result
Wrong result
Wrong result
Wrong result

Rank = 1
RR = 1

Wrong result
Correct result
Wrong result
Wrong result
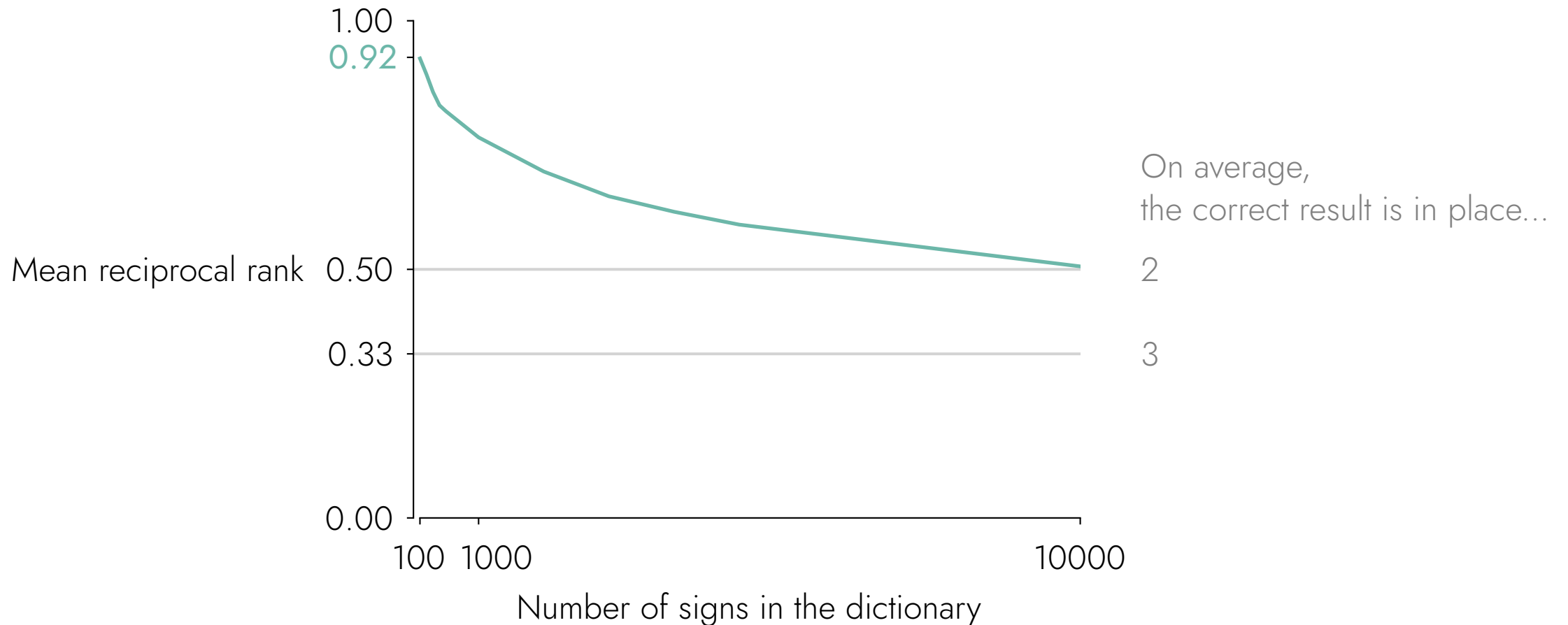
Rank = 2
RR = 0.5

Wrong result
Wrong result
Wrong result
Correct result

Rank = 4
RR = 0.25

Our prototype can recognise unknown signs with remarkable accuracy

Mean reciprocal rank

On average,
the correct result is in place...

2

3

One shot sign language recognition
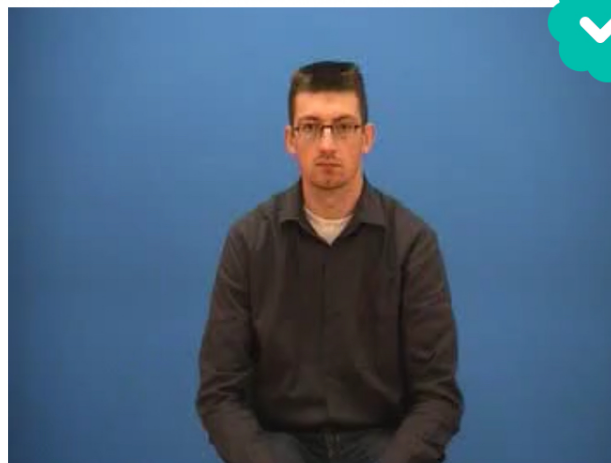classifies unknown signs

Human keypoint estimation and self-attention
enable one shot sign language recognition

Our prototype can recognise unknown signs
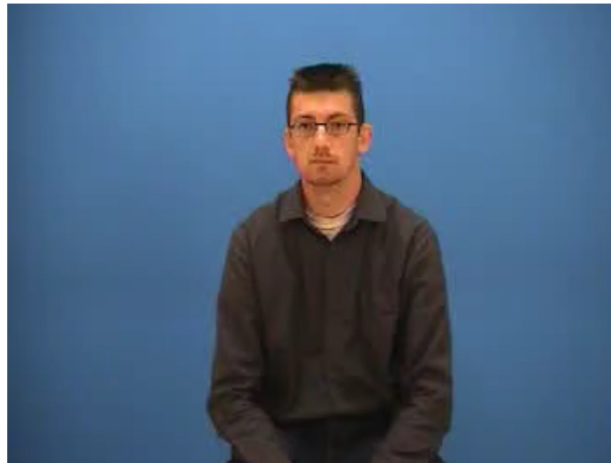with remarkable accuracy

☑ Stap 4. Klaar!

✅ Gelukt. SignBuddy heeft het juiste gebaar gevonden in het woordenboek

Hieronder zie je de 6 gebaren die er volgens SignBuddy het meest op lijken:

bleek

asfaltweg

achter