





A Study for Establishing a Smart Robotics System Used for Children's Vocabs Learning of Different Languages

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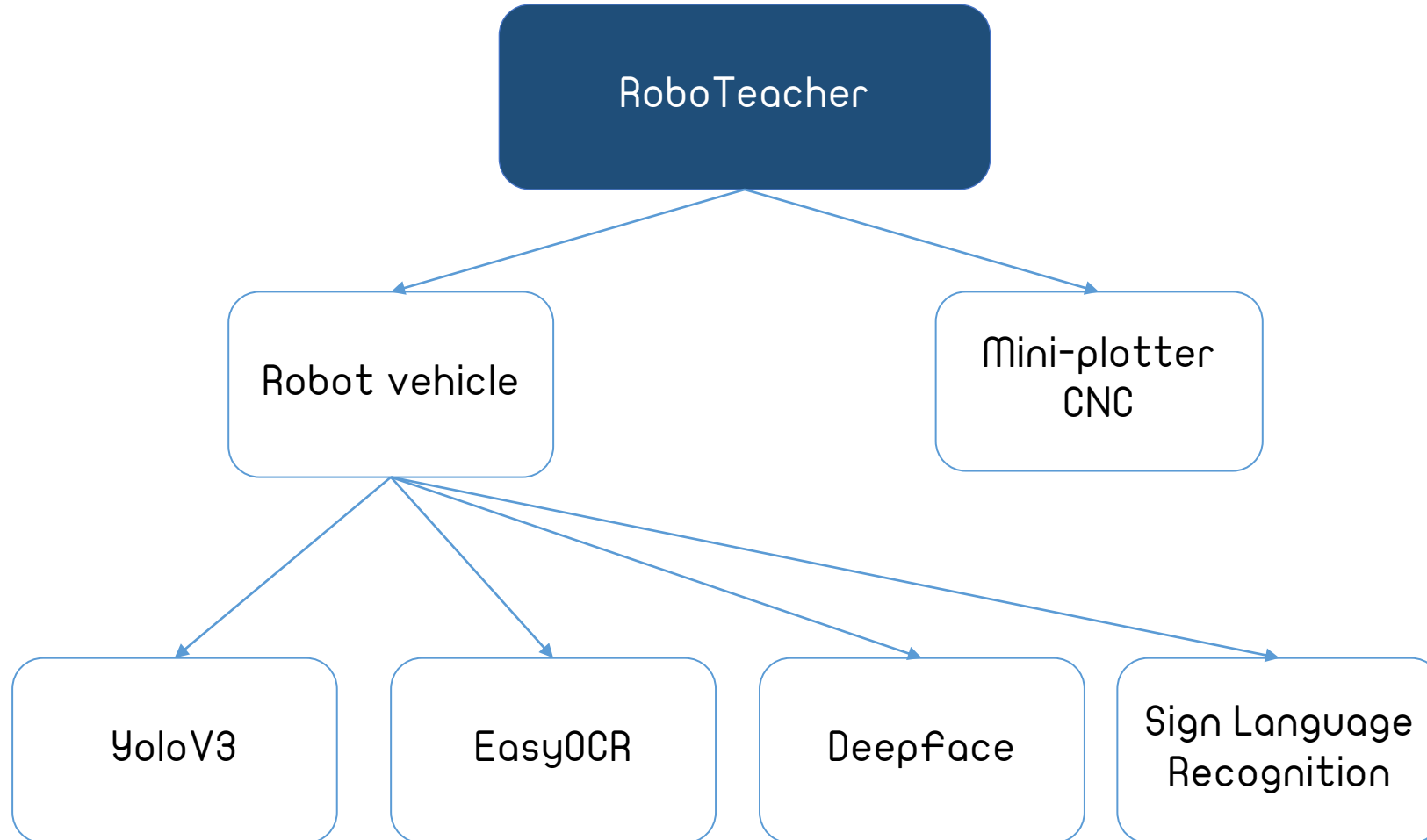
Introduction

- The importance of smart robots in the field of interactive learning.
- Learning languages difficulties for children, including deaf-mute children.



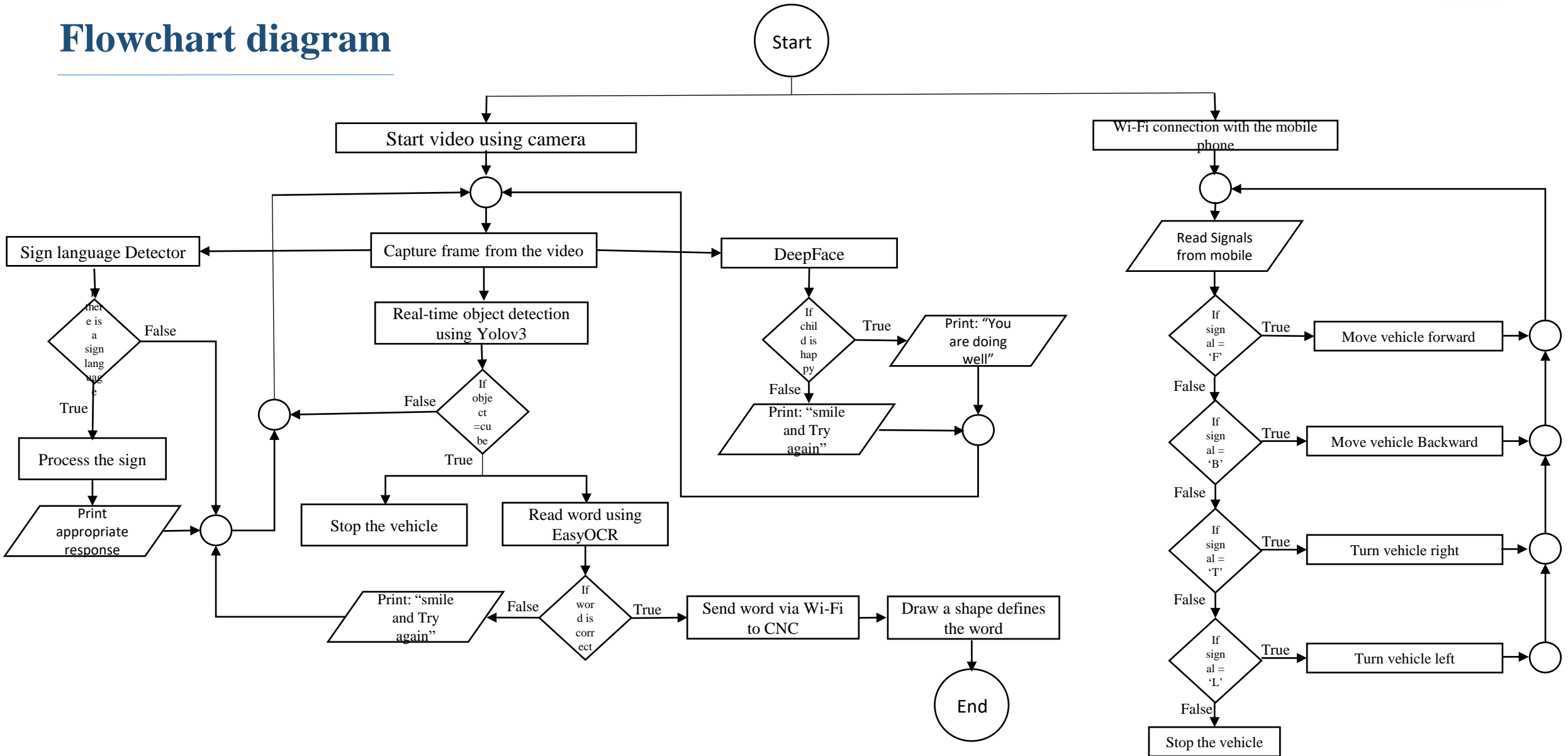


The Goal of this Research





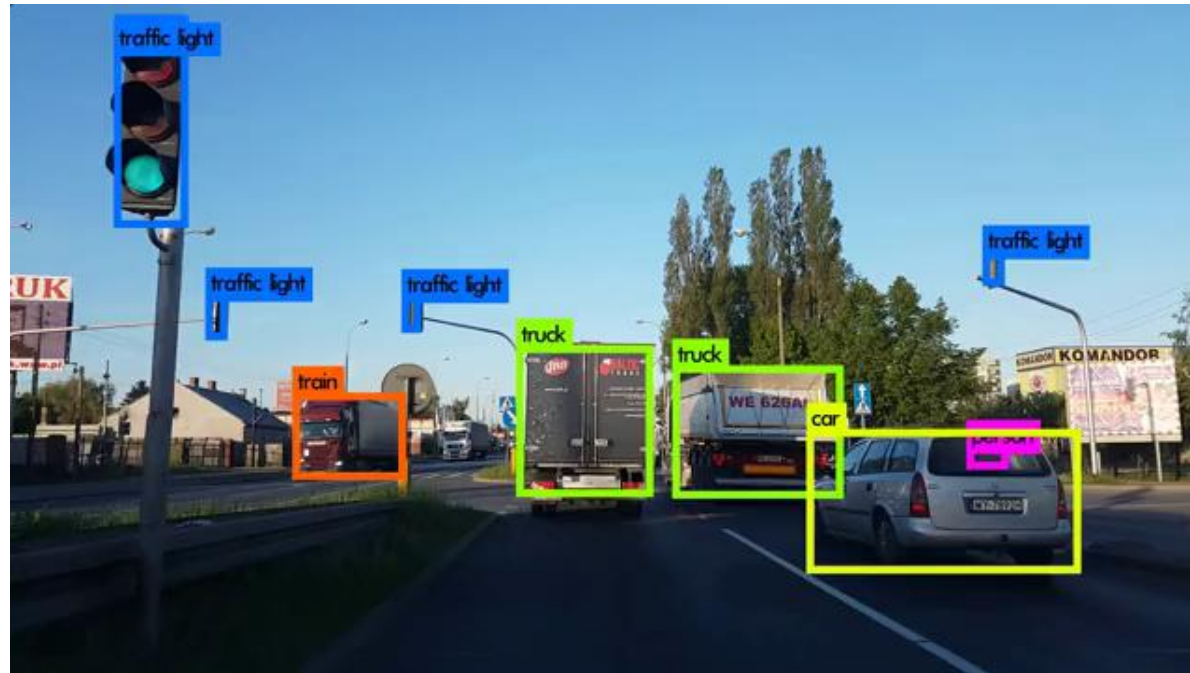
Flowchart diagram





Materials and Methods

I. YoloV3 Convolutional Neural Networks





Materials and Methods

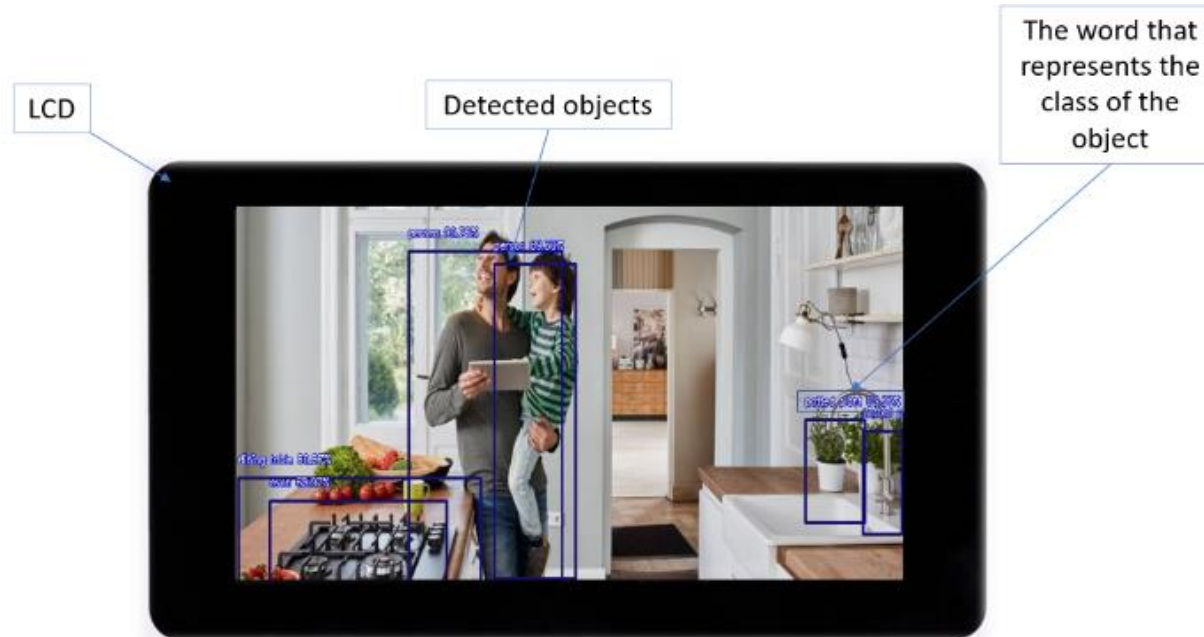
I. YoloV3 Convolutional Neural Networks

Backbone	Top-1	Top-5	Ops	BFLOP/s	FPS
Darknet-19	74.1	91.8	7.29	1246	171
ResNet-101	77.1	93.7	19.7	1039	53
ResNet-152	77.6	93.8	29.4	1090	37
Darknet-53	77.2	93.8	18.7	1457	78



Materials and Methods

I. YoloV3 Convolutional Neural Networks





Materials and Methods

II. Optical Character Recognition

- EasyOCR.
- The number of Supported languages is 80.

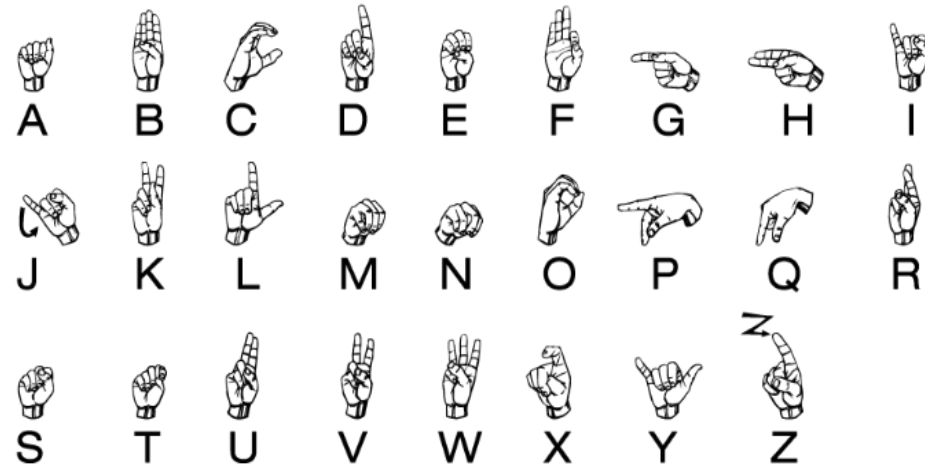




Materials and Methods

III. Sign Language Recognition

- Fingerspelling.



Materials and Methods

III. Sign Language Recognition

- IBM Watson.



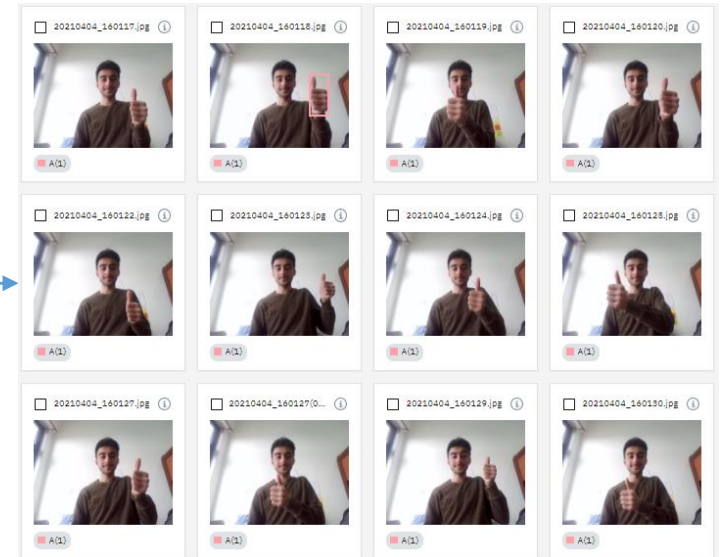
Materials and Methods

III. Sign Language Recognition

- IBM Watson.



IBM Watson





Materials and Methods

IV. Emotion Recognition

- DeepFace is a deep learning facial recognition system created by a research group at Facebook.



DeepFace

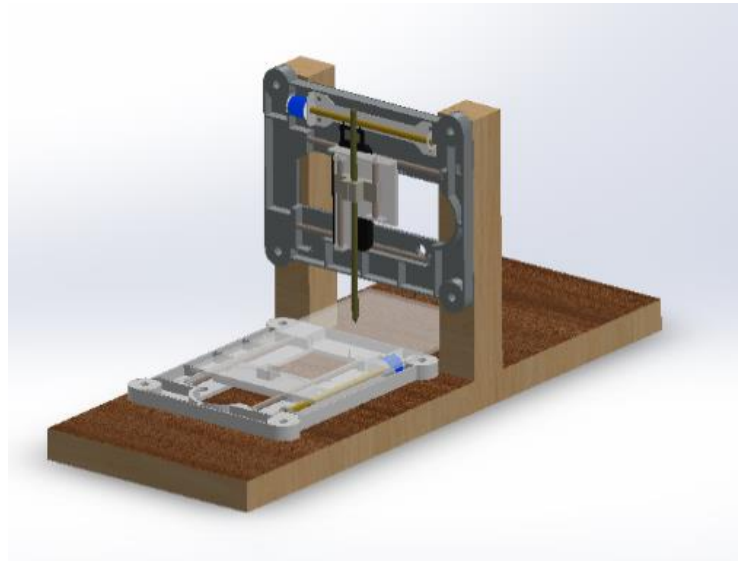
Emotion	The ratio
Angry	4.79940254205502e-09
Disgust	1.6474129382528687e-22
Fear	1.3519313446508363e-07
Happy	99.99927282333374
Sad	0.0007210150215541944
Surprise	6.306941595498813e-12
Neutral	8.387059580172718e-06



Materials and Methods

V. Mini-plotter CNC

- CNC design.

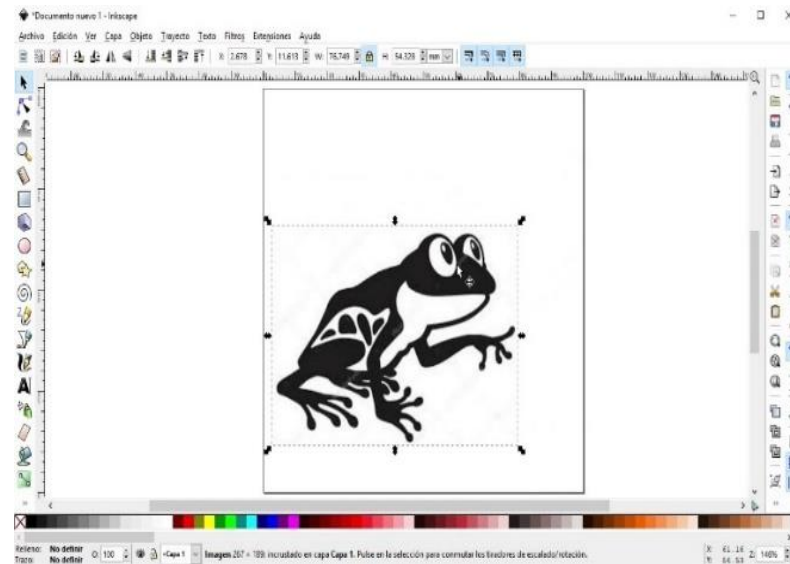




Materials and Methods

V. Mini-plotter CNC

- Preparing the database.

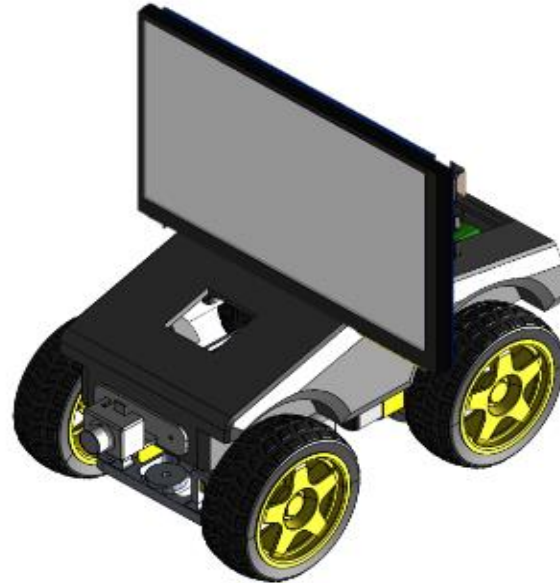




Materials and Methods

VI. Robot design

- SOLIDWORKS design of the robot vehicle.





Results

- Helping children at an early stage recognize the names of the objects of their surroundings.
- Helping deaf-mute children clarify their needs.
- Providing an interactive learning environment for the children.
- Providing the opportunity to use the appropriate learning style based on the child's emotions.



Future work

- Developing the robot to be able to pronounce words using text to speech algorithms.
- The work of the robot is not limited to teaching languages.
- Developing the learning strategy.
- Using Sign Language Detector to help people understanding deaf-mute children needs.



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Thank you for your attention
