

TONE-DOWN

Team members

Lojaien AlShabool: team leader
Seleen Al-bayayda: Resource Investigator
Mohammed Rashdan: Programming

My Hand is my Mouth
My Eye is my Ear

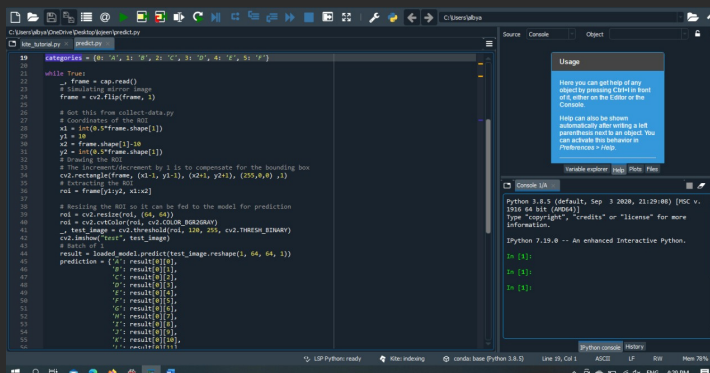
Aim of our project

The issue we want to tackle is that there is a failure to provide adequate services for the deaf and mute, especially in public places, in addition to their illiteracy rate, which makes the issue of expressing their needs more difficult.

Thus, Tone-Down application aims to empower deaf-mute individuals to belong to the community and boosting their self-confidence with ease and in an inexpensive way even if the deaf or mute person is illiterate by scanning the hand gestures of deaf-mute individuals using the smart phone or laptop camera.

Sustainable Development Goals

Sustainable Development Goals addressed by our project are goals 3, 4,9,10 and 17. Which are: Good Health and Well-being, Quality Education, Industry Innovation and Infrastructure, Reduced Inequality and Partnerships to achieve the Goal. As Tone-Down application enables deaf and mute people to communicate with normal people which improve their mental- health in addition to quality education, because they can learn in schools and colleges, and from anyone without a need for a sign language expert. As well as, they will have more job opportunities since their inability to speak or hear does not constitute an obstacle to express their creativity and talents which works on equality between them and the normal individuals.



```
categories = ('0', '1', '2', '3', '4', '5', '6', '7', '8', '9', 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z')
while True:
    frame = cap.read()
    # Simulating error image
    frame = cv2.cvtColor(frame, 1)
    # Get this from collect data.py
    # Coordinates of the ROI
    x1 = int(0.5*frame.shape[1])
    y1 = 10
    x2 = int(0.5*frame.shape[1]-10)
    y2 = int(0.5*frame.shape[1])
    # Cropping the ROI
    # The increment/decrement by 1 is to compensate for the bounding box
    cv2.rectangle(frame, (x1-1, y1-1), (x2+1, y2+1), (255,0,0), 3)
    # Extracting the ROI
    roi = frame[y1:y2, x1:x2]
    # Resizing the ROI so it can be fed to the model for prediction
    roi = cv2.resize(roi, (64, 64))
    roi = cv2.cvtColor(roi, cv2.COLOR_BGR2GRAY)
    _, test_image = cv2.threshold(roi, 120, 255, cv2.THRESH_BINARY)
    show_image('ROI', test_image)
    # Path of
    result = loaded_model.predict(test_image.reshape(1, 64, 64, 1))
    prediction = ('A' if result[0] == 0 else result[0])
    print('Predicted class: %s' % prediction)
```

Our Project

Tone-Down is an application that proposes to facilitate communication between deaf-mute individuals and the hearing ones by translating sign language to written text using a mobile phone's camera. The application also contains an option for normal people to learn sign language if they wish to do so.

TIME-BOUND

Our project has 2 phases:
The first phase is setting up the programming software of the Tone Down application.
The second phase is the social awareness and the prototype trials. They are scheduled between the 16th of May and 10th of June. This period will mark the accomplishment of the first phase, and we will provide feedback and suggestions from the public during this time.



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Our Successes

We have successfully completed the programming of Tone-Down application with 97.8% accuracy. We have also collected information about the deaf-mute community, the difficulties they face in education and communication in general and how we can help them overcome these difficulties.

Though we have collected enough information for our future awareness sessions and campaigns, we haven't been able to present all of them due to the COVID-19 pandemic. However, we are looking for ways to communicate with our project stakeholders digitally.

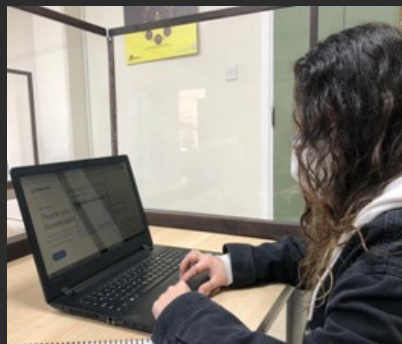
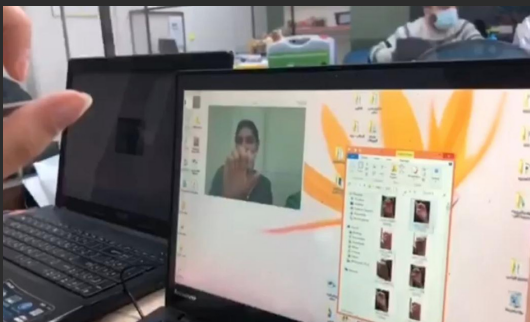
IMPACT ON COMMUNITY

Our project aims to raise the general awareness of the importance of deaf-mute community in the general community and in our school. We want to collaborate with other organizations, organize awareness campaigns and carry out many other activities to encourage a sustainable lifestyle and integrate the deaf-mute individuals in the society.

What we have learned and skills that we gained during GSL Adventure

- We learned new terms in programming languages and how to use them correctly. We also assembled a large database and had meetings with programming engineers, which helped us a lot.
- we gained problem solving skills which taught us how to look at an issue from different perspectives
- understood the difficulties either physically or mentally that mute and deaf people face globally
- Marketing skills by promoting our app (tonedown) on social media platforms.
- we also participated in workshops which helped us gain advanced marketing techniques.

Generally, the experience so far has led to us becoming more self-aware about our country and our world. The project, product, that we have set out to create requires many skills to achieve. These skills include coding, mechanics, marketing, and researching.



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