BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY

Department of Electrical and Electronic Engineering

Course No. : EEE 312   **Group No** : 6

Course Title: Digital Signal Processing I Laboratory   **Section:** C1

Project Proposal Submission

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1. Drowsiness Identification Using MATLAB Video Processing

Introduction

Numerous studies indicate that one of the major reasons of road accidents is drowsy driving. One of the biggest challenges in the field of accident prevention is the creation of technologies that can stop drowsiness at the time. The ability to create intelligent vehicle systems has been made possible by advancements in computing technology. The goal of this study is to identify driver drowsiness in order to reduce accidents and increase highway safety. On the basis of video analysis, a system for detecting driver fatigue or drowsiness is presented. The driver's face region is located using a real-time face detection system. By using a camera that is pointed directly at the driver's face and recording video, a technique for detecting drowsiness in drivers has been developed. The system uses image processing technology to examine video camera images of the driver's face as a detection method. The finished video is converted into a number of frames of images, and the face and eyes are observed to look for signs of sleepiness. The system has the capacity to monitor eyes and determine whether they are open or exhibiting signs of sleepiness. This detection system provides a noncontact technique for judging various level of alertness and facilitates early detection of a decline in alertness during driving.

Flowchart of proposed drowsiness warning system :
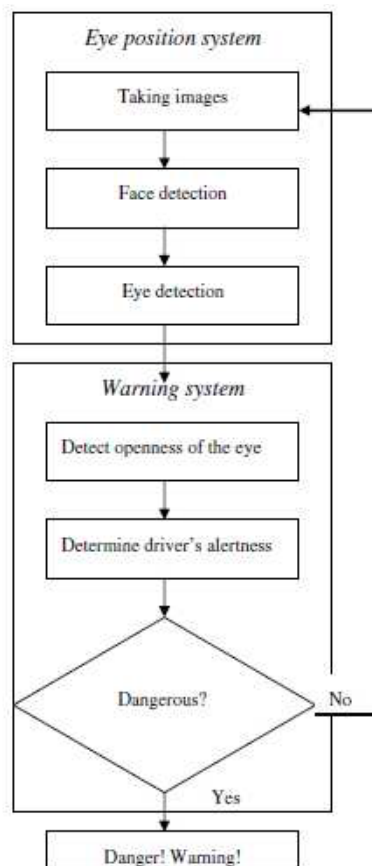
Case study

Mainly there will be three steps:
1. Face detection
2. Eye detection
3. Stage of eyes(open/closed)

Workflow:

1. Read the record video using video reader
2. Convert video into number of frames
3. Face detection
4. Eye Detection
5. Stage of eyes (open/closed)

Future work:

Currently there is not adjustment in zoom or direction of the camera during operation. Future work may be to automatically zoom in on the eyes once they are localized. This would avoid the trade-off between having a wide field of view in order to locate the eyes, and a narrow view in order to detect fatigue.

2. The Visual Microphone

Objectives:

- Recovering Sound from a muted Video

Introduction:

The main idea of this project will be to recover sound from a video. When sound hits an object, it causes small vibrations of the object's surface. We show how, using only high-speed video of the object, we can extract those minute vibrations and partially recover the sound that produced them, allowing us to turn everyday objects—a glass of water, a potted plant, a box of tissues, or a bag of chips—into visual microphones.
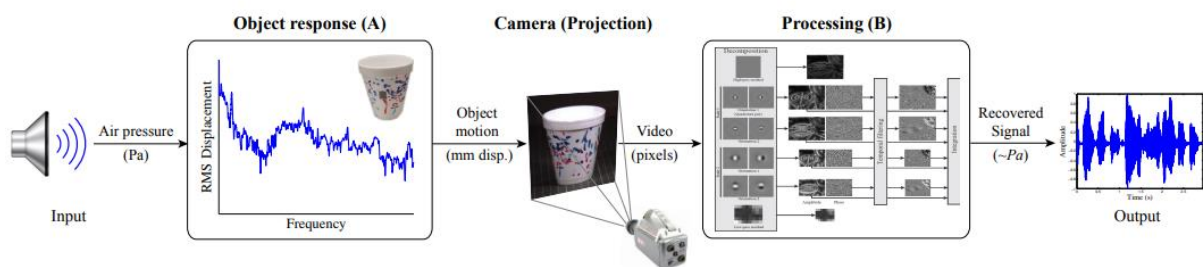
References: http://people.csail.mit.edu/mrub/papers/VisualMic_SIGGRAPH2014.pdf

3. Automatic Symptom-Based Disease Detection from Patient's Voice(Bengali)

Description: Most of the times the patients don't know which type of doctor they should consult with which might lead to wrong treatment or loss of crucial time. So, the main idea of this project is to suggest the correct specialist doctor by analyzing the symptoms. So, the patient will tell his/her symptoms in Bengali and our system will predict the specialist doctor for the patient by analyzing the speech signal through Deep Neural Networks.
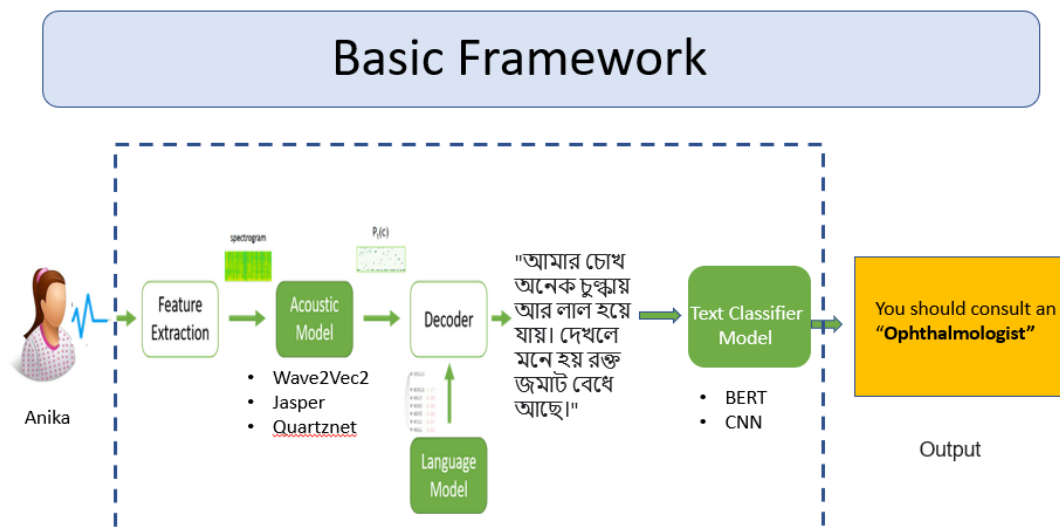
In this project we will use Automatic Speech Recognition for Bengali and the Bangla text classifier. The datasets for both of these tasks are available on the internet.

References:

- https://www.kaggle.com/datasets/shashwatwork/bengali-medical-dataset
(Dataset for Bengali Medical symptom detection)
- https://www.kaggle.com/competitions/dlsprint/data (Dataset for Bengali ASR)