

**CEN320 and BME320**

**Project Description**

**Sound Recognition and Visualization**

# Objectives

1. Use MATLAB software to simulate a sound visualizer.
2. Find the Fourier transform of various recorded audio signals.
3. Plot the recorded audio signals.
4. Obtain the statistical features of the recorded audio signals.

# Project Description

In this project, you are required to design a sound recognition and visualization on MATLAB. Your project should allow the user to:

* Record an audio message.
* Display the recorded audio signal.
* Obtain and plot the Fourier transform of the recorded audio signal.
* Plot the Power Spectrum of the recorded audio signal.
* Calculate the Energy of the recorded audio signal.
* Calculate the power spectral density of the recorded audio signal.
* Find the maximum frequency component of the recorded audio signal.
* Plot the histogram of the recorded audio signal.
* Obtain the statistical features of the recorded audio signal, including the mean, standard deviation, variance, etc..

Each member of the project group should record and test the following sentence in the GUI:

## ”Hello, I am an ADU’er.”

For the project report, kindly utilize the template provided online. Kindly follow the sections mentioned in the project report guidelines. Make sure you include a discussion on the motivation for the project.

1

# Design Constraints

1. The system should be implemented using MATLAB.
2. The system needs to visualize the audio signals recorded by the user.
3. The system needs to analyze the recorded audio signals.

# Project Deadlines

Implement a fully functional m-file on MATLAB. You will be requested to demo your project by the latest **23/11/2023**. The last day to submit a full-fledged project report following the new project guidelines is **23/11/2023**.

2