

Project Title: **Stop Noise Pollution From Honking**

Group No.: **DD-15**

Names and Roll Numbers:

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Project Objectives

Horn blowing leads to noise pollution and creates a chaotic environment. Our project aims to:

- Develop a system which would record the number of times and rate at which a horn is pressed by the driver and transmit it to a server.
- The average number of violations in the long term would be further linked with driving capability which in turn could be used to calculate insurance premium or permit charges for the taxi or give rewards to heedful drivers.
- If the driver tries to tamper with the device we install, we will send a signal to the server saying the device has been tampered with and accordingly, strict actions can be undertaken.

Project Deliverables

Our electronic design project will be able to:

- Discriminate between the horn of a car and others around it using amplitude and frequency discriminator techniques and circuits
- If identified as the horn of the car the device is installed in, it should increase the total number of horn count and transmit this to a server using a microcontroller and ESP8266
- Calculate the long term average data from the data we transmit and reward people who honk only when required.
- Detect if our device was tampered with and if yes, transmit this info to the server

What makes our solution unique is that it can be installed in new as well as old cars with no change to the car circuitry.

Work done so far

- 1) Constructed an 8th order Band pass filter by combining an 8th order low pass and high pass filter for frequencies between 400-700 Hz (car horn range) - *Dimple, Pratyush*
- 2) Made a mic amplifier circuit and tuned it to give desired amplitude - *Dimple*
- 3) Implemented an amplitude discriminator block using a comparator and a rectifier, and set a threshold to see if the horn (sound given using a mobile phone) matches the expected amplitude - *Dimple, Nisha*
- 4) Combined all the above blocks together and verified that this system works - *Dimple*
- 5) Completed PCB design of amplitude discriminator circuit - *Pratyush*
- 6) Researched on the digital potentiometer required to calibrate frequency of the horn before starting use - *Pratyush, Nisha*
- 7) Explored VCOs and phase detectors for constructing a PLL for the frequency discrimination block - *Nisha*
- 8) Started coding of TIVA microcontroller for frequency detection for initial calibration - *Nisha*
- 9) Voltage Regulator assignment - *Pratyush, Nisha*