**Course Name: Computer Vision**

**Course Code: 19AI621**

**Course Advisor: Dr. Senthilkumar T**

**Title: Lane Detection for Autonomous Vehicles using Computer Vision Algorithm**

**Submitted By:**

**Abhishek Gopinath [CB.EN.P2AID20002]**

**Alan Henry [CB.EN.P2AID20010]**

**Jiss Joseph Thomas [CB.EN.P2AID20024]**

**Spatial Domain Operations on Case Study Image**

**Original Image:**

****

**Image Smoothing**

#### **Average Filter**



#### **Weighted Average Filter**

****

#### **Gaussian Blurring**



#### **Median Filter**

****

#### **Image Sharpening**



#### **Roberts Filter**

****

#### **Sobel Filter**

****

#### **Gamma Transform**

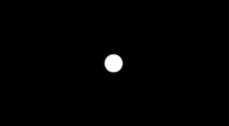


#### **Log Transform**

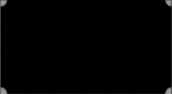


**Frequency Domain:**

* **Image After Applying Noise:**
* **Low Pass Filter:**

****

* **Decentralized Image:**

****

* **Processed Image:**

****

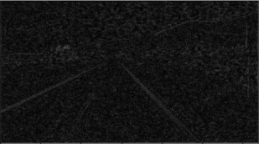
* **High Pass Filter:**

****

* **Decentralize:**

****

* **Processed Image:**

****

* **Ideal Low Pass Filter**



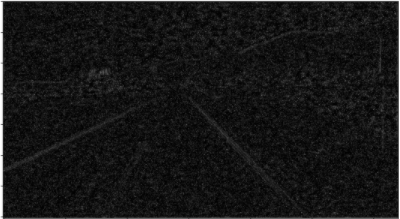
* **Butterworth Low Pass Filter:**

****

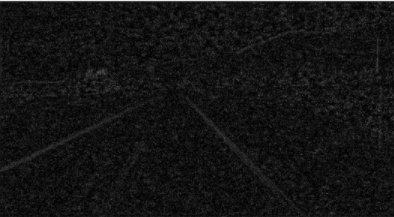
* **Gaussian Low Pass Filter**

****

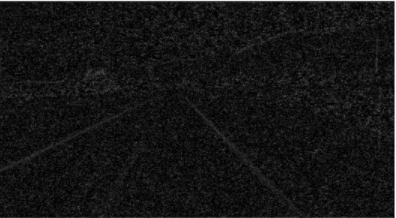
* **Ideal High pass Filter**

****

* **Butterworth High Pass Filter:**

****

* **Gaussian High Pass Filter**

****

**Observation after Comparison Between Spatial and Frequency Domain Filters:**

**Spatial Domain:**

**Input -> Image Processing -> Output**

**Frequency Domain:**

**Frequency + Distribution -> Image Processing -> Inverse Transformation -> Output**

* Spatial domain deals with image plane itself whereas Frequency domain deals with the rate of pixel change.
* Spatial domain works based on direct manipulation of pixels whereas Frequency domain works based on modifying fourier transform.
* Spatial domain takes less time to computer whereas Frequency domain takes more time to compute.