PHD Topics

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| **Sl.No** | **Topic** | **Description** | **Concepts** |
| 1 | Real-Time Detection of Potholes and alarming the driver on Indian roads | Indian roads contain lot of potholes and some are very dangerous and hard to locate for a car driver. The proposed algorithm finds the potholes that are present at a distance and alarms the driver to slow down the vehicle | Image Processing basics, Machine Learning/Deep Learning, Depth Detection. |
| 2 | Video Synopsis | A lot of videos captured in CCTV cameras are very lengthy and contains sparse information. The proposed system takes input from a video camera and creates a summary video. The envisaged system would retain and store only video footage that contains interesting material. | Video processing, deep Learning |
| 3 | Modification of SGM(Semi-Global Matching) disparity detection algorithm | Current SGM algorithm is very widely used in all stereo camera system. However, SGM algorithm is very slow and requires lot of computational time and memory to calculate disparity. Minor and subtle modification to the algorithms can be made to improve speed which will be helpful for real time depth detection. | Camera Calibration, Stereo image processing, CPU/GPU |
| 4 | Video surveillance in retail market (like shopping malls) and understanding the insights if the customers. | Understanding business insights is the need of the hour. A camera can be mounted on the shelf of the mall to understand the product bought by the customer, finding which product is going well or vice versa. | Video processing, deep Learning |
| 5 | Obstacle detection in cars (automobiles) | For driverless cars, it is very essential to detect and locate obstacles in real-time. Obstacles can be detected using computer vision algorithms. | 3D stereo, image processing, machine learning |
| 6 | Online hand-written character recognition | These days most of the people are using pads and phone to take notes. Algorithms can be developed to recognize the hand-written characters written by people. | OCR, RNN |
| 7 | Lesions detection/blood vessel detection on retinal images (medical image processing) | Diabetic patients have a lesions developed on their retina. These lesions can cause blindness. Early detection of lesions becomes essential for medical practioners. Image processing algorithms can be developed to detect the | Medical image processing, Machine Learning |
| 8 | Super resolution | Improving the image quality by sequentially capturing the images and combining them. |  |