**Headways Determination**

Determination of the headways involves recording frame numbers related to the events in the respective

From the region of interest determined, the change in pixels in the foreground at the same address is traced. Since the background is in binary condition, the change in pixels from zero to threshold value is noted. If the change increases above given threshold, then the frame number is picked. A vector with frame numbers which correspond to regions of interest filled above given threshold is formed.

Or

Through tracing the change in pixel values, a given threshold is determined.

**Acceptance rejection of gap determination**

For each gap, the decisions of acceptance and rejection have to be determined. the arrival of the vehicles at the conflict region, and their orientation have to be identified. Orientation of the approaching vehicles is determined for the purpose of separating approaching vehicles from circulating vehicles.

A frame number corresponding to the presence of image in the conflict region + with orientation from approaching direction is determined. Then, for each gap, a number of vehicles that entered the region within a given gap is determined. T

Results

The results obtained from this involves the number of gaps corresponding to each gap accepted or rejected.

Masked Images

Through the use of image processing methods, the masked images can be used in determination of headways

**Literature review:**

. [2] used image detection algorithm to detect and eventually count vehicles in the road. And classify vehicles

[3] Developed an algorithm which could detect speed of vehicles

…carried out a study of counting vehicle in the main stream using image processing

…..carried out a study of vehicle classification using the image processing

..other studies have attempted to determine the pedestrians and other uses using image processing. 6i

Altay et al(2013) used LIDAR sensors to determine time to headway parameter in vehicles [4]

This study extends such good efforts into determination of acceptance and rejection of gaps.

**Abstract**

Gap acceptance models are applicable in determination of capacity of unsignalized intersections. The capacity of roundabouts as one case of unsignalized intersection, involves determination of accepted and rejected gaps, follow-up times and circulating flow traffic as parameters for determination of roundabouts’ capacity. A well-known technique involves manually recording the time events from videos recorded at intersection for determination of the said parameters. However, this process is time consuming and is associated with human errors during the process. This paper presents a tool for determination of the accepted and rejected gaps using image processing techniques which includes foreground detection, morphological operations and developing region of interest for the headways determination. The techniques have been programmed and implemented through the use of Matlab software. The performance of the method in determination of the headways goes to …. Percent accuracy when compared with manual approach.

**Introduction:**

Capacity analysis of roundabouts utilizes the gap acceptance theory. In roundabout’s capacity determination, determination of accepted gaps, rejected gaps, follow-up times and circulating traffic forms a core role. Gaps refers to time difference between successive vehicles in the circulating lanes. A gap in the circulating stream is said to be accepted if an approaching vehicle enters the intersection in the before expiration of such gap. On the other hand, a gap is rejected when the approaching vehicle doesn’t enter the intersection using the available gap.

Collection of the mentioned time events have been manually through video observation and hence record of the said events. Another option, has been to semi-automate the process by creating a program which records timestamps of certain events in the video for the purpose of determining the gap acceptance parameters.

The processes mentioned, since they involve human decisions upon the event, are not free from human errors in correctly recording the time events. In addition, the process is time consuming since a single video has to be played more than one times if an anticipated accuracy is to be expected.

This paper aims at utilizing the image processing methods in determination of gap acceptance parameters at roundabouts. Since the process runs solely depending upon computer vision, it involves reduced human errors and expedited extraction process.