

# **PROJECT REPORT**

## **INTRODUCTION:**

The Digital Image Processing (DIP) project cum assignment was based on the concept of computer vision. It was inspired from the research paper of M., Shah and S., Ali titled as “A Lagrangian Particle Dynamics Approach for crowd flow segmentation and stability analysis”.

## **AIM:**

The project was aimed to creating watershed segmentation through the help Open CV, Matplotlib and NumPy. This is aimed to be the first step towards the building an automated monitoring system under dense crowd flow.

The dataset was expected to be processed through various steps including Optical Flow, Streak lines, Streak Flow and Watershed Segmentation.

## **APPROACHES USED:**

Through the limited knowledge we could gather regarding the assignment/ research paper/project, we attempted to find the watershed segmentation of the given dataset. The first step was easy to implement as the code for the same was available on the OpenCV website. The streak lines were partially implemented on the optical flow results.

## **TECH STACK USED:**

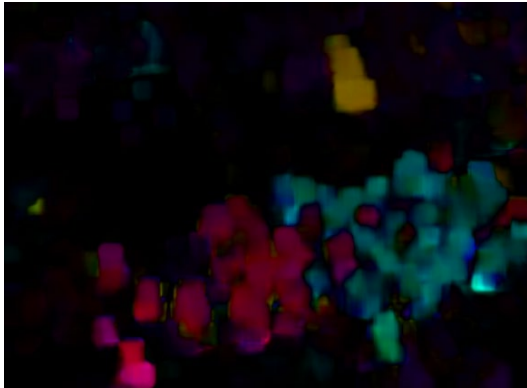
The project was attempted to be done on Open CV, NumPy along with Python. Major reason of using Open CV over MATLAB was that we had a decent idea about how Python works, so it was easier to brainstorm ideas and approaches.

Several inbuilt functions of Open CV libraries were used like the cv. calcOpticalFlowPyrLK (), cv. VideoCapture () etc. were used.

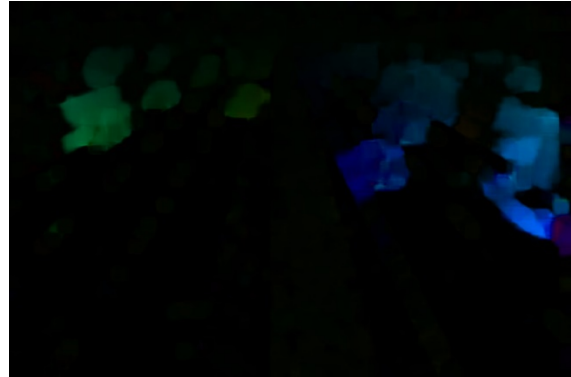
## **RESULTS:**

We were able to implement the first step i.e., Dense Optical Flow by using Open CV. The next step i.e., streak lines implementation was partially completed. Further, the transformation of streak lines into streak flow and then into similarities was left undone.

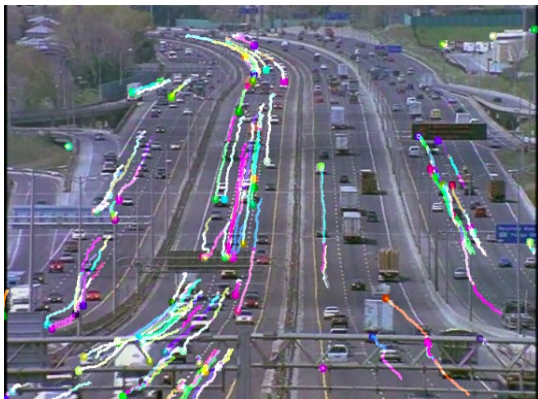
Result-1: Dense Optical Flow-1



Result-2: Dense Optical Flow-2



Result-3: Streak Lines-1



Result-4: Streak Lines-2



### **EXPECTED RESULTS:**

The assignment was intended to find out the watershed segmentation and instantaneous streak lines of the given dataset.

## **REFERENCES AND LINKS:**

1. [OpenCV: Optical Flow](#)
2. [OpenCV: Image Segmentation with Watershed Algorithm](#)
3. [Crowd Flow Segmentation - Saad Ali \(ucf.edu\)](#)
4. [CRCV | Center for Research in Computer Vision at the University of Central Florida \(ucf.edu\)](#)

## **GROUP MEMBERS:**

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