

## Miniproject two – Traffic analysis

In this miniproject, you will work in groups of up to three students; you are free to change groups from the first miniproject. The project is on analysing videosequences of intersections and add new information about the motion of the vehicles in the scene. To extract vehicle trajectories you will use methods like background subtraction, optical flow and kalman filtering. A perspective correction is needed to accurately estimate vehicle speeds in the ground / road plane.

I expect you to hand in a report that describes how you have dealt with the exercises listed below. Please include the following elements in the report:

- descriptions of what has been done
- references to sources of information
- source code for reproducing the results
- example output data
- comments on results

The report should be handed in before Thursday the 22th of March at midnight (23.59).

### Exercise 1

Go to [www.trafikanalyse.dk](http://www.trafikanalyse.dk) and choose one video to work on. A video with a lot of cars moving around and a fixed field of view is ideal.

### Exercise 2

Locate things that move in the video, by utilizing some kind of background estimation model.

### Exercise 3

Locate four reference points in one frame of the video and match these four points with their real coordinates as they are given on google maps.

### Exercise 4

Correct the perspective of the video sequence. Discuss the assumptions that are made to do this correction?

### Exercise 5

Use the moving objects from exercise 2 and locate their trajectories. Here it could be beneficial to look at optical flow, for matching objects from one frame to the next.

### Exercise 6

Estimate the motion in x and y coordinates over time by using a Kalman filter. Use the trajectories from exercise 5 and project them down on the ground plane.

### Exercise 7

Add information to the video about the ground speed of the tracked vehicles.