

Chapter 7

Conclusion and further work

This study was motivated by the problem of determining the point of origin of a bloodstain. We have studied the methods currently used by forensic experts which are not very accurate due to the negligence of the influence of drag and gravitational forces and the assumption of a linear trajectory. The influence of these on forces were studied and equations to describe the non-linear trajectory of a single droplet were derived. In the case of describing the trajectory of multi droplets, we have used the principles of multi-target tracking. With these principles we were able to describe the movement of droplets from a starting point to an end point in terms of a linear programming problem. Solving the linear programming problem we can determine the cost of each directed edge which allows us to construct a directed acyclic graph. In order to determine the shortest path in the graph we used the algorithms of Dijkstra and Floyd-Warshall. Using two Matlab program codes for these two algorithms we were able to solve different problems.

Multi-target tracking in computer vision is an old problem, but the efficiency of these methods to back track a bloodstain still need to be tested. In problem two in chapter six we have illustrated how it can be used to solve a specific problem. The case of more trajectories and where the height also varies remain to be investigated.