This document describes the scenario used for the assessment of CS34110 Computer Vision. This scenario is a specification of a problem which could be addressed by computer vision.

The assignment, worth 30%, will require you to write a paper on a scientfic publication[1] which could be used to address the scenario, discussing the presented method and given results, as well as offering a critique of the paper. The written examination, worth 70%, will consist of a number of questions designed to assess your understanding of the scenario, methods that could be applied to solve the problem it poses, and the general area of Computer Vision. For the written examination you will be able to take with you up to five A4 sheets of paper, i.e. up to ten sides of A4 paper. You will not be given a copy of this document but a brief reminder of the scenario.

People counting

Many businesses and organisations find themselves wanting to count people. Possible motivations for this are ...

- **Safety**: People are employed to count attendees on their way into a venue, to ensure that an auditorium or a stadium does not become overcrowded
- **Money**: Groups of people going on a trip or an excursion are counted, so that the organisation which offers the trip is able to charge for the right number of attendees
- **Customer service**: Supermarkets wish to determine how many people are in each checkout queue, so they can decide whether to open extra lines or not.

This is a problem which could be addressed in many ways by computer vision algorithms; in particular approaches based upon *Tracking* and approaches based upon *Detection* could both be employed (as could hybrid approaches). Some methods will be more likely to miss people (false negatives – there is a person in the scene, but the software has said there is not). Other methods will be more likely to accidentally count non-people (false positives – the software says there is a person in the scene, but actually it was a dog). This scenario is also open to a range of different data capture setups: single or multiple cameras could be used; 2D or 3D acquisition methods; using the visible spectrum or infra-red. Or some combination.

Using this scenario

The aim of the scenario is to provide you with a concrete computer vision problem, which hopefully helps you to think about how the more abstract and mathematical aspects of the course might be applied. When completing the assignment, reading articles, playing with computer vision methods, and revising for the exam, keep it in mind. You might even want to install OpenCV and have a go at attacking the problem yourself.

References

[1] Paul Viola and Michael Jones. Robust real-time face detection. *International Journal of Computer Vision*, 57(2):137–154, 2004.