



research school of **informatics**

Project Title:	Robust Visual Automatic Asset Detection From a Vehicular Platform
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Department:	Computer Science

Project Description:

Asset management systems provide tools for managing large volumes of spatially acquired (image) data. Typically, mobile platforms (e.g. cars or trains) are equipped with both image capturing apparatus and geographical positioning equipment. From which, it is possible to identify objects present at specific geographical locations and hence maps of important assets can be created. The image data captured can be processed manually for this detection of assets. But, the automation of asset detection can greatly increase efficiency. Obvious choices for this automation are object recognition methods, which can be trained to locate objects present in an image. In some applications, the distance at which an object can appear from the observer is unconstrained. This change of distance can affect the appearance of an object.

It is the combination of asset management systems and distance-invariant object recognition that is the main focus of this research. The main motivation for the research into this combination of asset management systems and distance-invariant object recognition is to provide information regarding asset sighting distances. Sighting distance calculation is the determination of the maximum distance an object (or asset) can be seen from. This is useful, because it means that the distance an object can be observed from on multiple dates can be compared to determine if maintenance work needs to be performed. For example, imagine a speed limit sign on a set of train tracks and a train which runs on these tracks and uses a front-forward facing camera to capture what can be seen. Images are captured on two dates - 0 and 1. A sighting distance system is executed on both of these sets of images. The speed limit sign can be seen 700 yards away on date 0, but only 300 yards away on date 1 - a significant reduction of sighting distances between dates 0 and 1 has occurred. This is illustrated in the figure below. This reduction can then be flagged for someone to investigate and remedy the potential problem. Note, the reason for this reduction can be something else such as vegetation or another object has moved to obscure the speed limit sign. With a distance-invariant method of object recognition, a method which calculates sighting distances would be able to detect objects

further away, hence increasing the scope (in terms of environment) the system can recognize.