

Introduction

While much research has been conducted on 2D object retrieval, an increased interest for 3D object retrieval is observable.

The Museum of Amsterdam, for example, has created the Museum App¹ for mobile phones, which currently operates within a 2D environment.

To improve the user experience a decision has been made to incorporate Augmented Reality into the device to transform the existing data from the tour to a live, direct or indirect, view of a physical, real-world (3D) environment of which the elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data. It is within this new environment that the user will be able to find a given object, as described in the tour, by means of the method of highlighting recognized patterns, in real-time.

This research focuses on finding the most suitable manner for adding the Augmented Reality feature to the existing application. However, due to time constraints, the main focus lies on finding one particular object, in this case 'coat of arms', abstracted from the textual tour data.

For reasons made clear throughout the rest of this paper, this research uses HOG features (Dalal et al. 2005) to detect an object and SIFT (Lowe, 1999) to recognize an object in locale architecture, regardless the angle between the observer and the object. Even though we use HOG and SIFT as depictees, because they are widely used to retrieve 2D objects, problems occur when opting for the recognition of 3D objects. The detection of one of these problems will be presented at the end of the paper and is believed to contribute to the cause of implementing effective 3D object retrieval systems.

Outline The remainder of this article is organized as follows. Section 2 gives account of previous work to determine what is already available as potential solutions to this research. After which a description of the missing aspects on which the research question is based is presented in section 3. Section 4 then outlines the method and approach used to answer the research question and presents the added feature to the existing tour guidance application. Finally section 5 covers the evaluations, presents the results and reports the finding of this research.

¹ An enhanced museum guidance system that uses trigger points, information nodes related to GEO points, to enrich the user with content during a tour around the city of Amsterdam.