

RESUME OF GRADUATION PROJECT

★ 基于街景影像的街道停车场判读项目

Project of Street Parking Lot Interpretation based on Street View Images

This project uses Google Street View imagery to detect parking spaces on the street, and obtains corresponding information by visually interpreting the detection results. Street view images can truly collect scene information at the same place at different times and facilitate the extraction of street parking information. Target detection technology is used to detect the location of the parking lot and update the database associated with the high-precision map, which can effectively reduce the amount of data and processing time that needs to be processed on the map, thereby reducing the redundant data generated in the map update. However, street view images are affected by non-human factors such as weather, light, and sensors during collection, and images collected at different times usually have nonlinear changes, resulting in many irrelevant changes in the images, which could not directly match the detection results. This project extracts the street parking lot information from the street view image through the server firstly, then selects the appropriate preprocessing method for recognition, and finally determines the recognition effect through artificial visual interpretation in the system.

On-street parking can be detected using two methods, Hough transform and Scale-invariant feature transform (SIFT) algorithm. Geometric figures with special shapes usually appear in digital images, such as a straight line found on the side of a road. Detection of specific features requires the use of the Hough transform, which is used to identify features in the object. The algorithm performs voting in parameter space to determine the shape of features in the image, determined by local maxima in the accumulated space. In this project, the slope k and constant b of the straight line included in the image could be obtained by straight line detection. Similarly, the SIFT algorithm is a scale-invariant algorithm, which has certain stability to the image latitude and longitude tilt changes and noise, which has important value in the fields of scene matching and target recognition. The system machine algorithm used in the project has achieved a high recognition rate and accuracy. With the support of artificial visual interpretation in the later stage, the recognition task has achieved satisfactory results.

Keywords: Target detection, Google Street View, Image processing, Hough transform, SIFT, Image interpretation