

Automatic inventory mapping of stock

Background

An important skill for future robots and automated guided vehicles (AGV:s) is the ability to recognize and describe objects that the robot shall handle and the environment in which the robot operates. This is an important step towards making robots more intelligent. The ability to structure and sort information provided by sensors increases the system's flexibility and ability to adapt to new settings (which in the end means lower costs). To do this with as few input parameters as possible is also a challenge. Example of such input parameters may be the warehouse management system, a database with descriptions of objects (e.g. images) and Cad-drawings of the warehouse (or an aerial map, e.g. from Google-maps, if the warehouse is locate outdoors).

Project description

The goal with this project is to develop a system for automatic mapping of articles and inventories in a warehouse.

The main tasks to achieve in this project are:

- A state-of-the-art inventory mapping
- Object recognition and classification using computer vision (experiments)



Project outline

The suggested project may be divided into three work packages: Writing a state-of-the-art of inventory mapping; Evaluate different methods for object recognition and classification; do real-world experiments with pictures from warehouse settings. Each work package may be divided into one or more sub packages. The projects start with identify this sub-packages, writing a project plan with suitable deadlines and description of deliverables of each work packages. The project plan shall be as concrete as possible.

WP1 – State-of-the-art Automatic inventory

Overview of different system solutions. Different mapping approaches. Scene interpretation

Deliverables: A written report.

WP2 – Object detection and classification

Testing different features for object detection like SIFT, SURF, HOG etc. and different classification methods like, SVM, Random Forest, Bag of words. Both supervised and unsupervised classification schemas shall be evaluated but a strong focus shall be on unsupervised learning methods.

Deliverables: Suggestion of suitable methods for object recognition and classification. Written report.

WP3 – Real world Experiment

Evaluation of the performance and feasibility of the suggested method shall be evaluated on data-sets from real-world settings.

Deliverables: Database that contains different data sets (images) from real world settings. Written report.

Skills acquired

The student will gain skills in vision based object recognition and supervised and unsupervised learning/classification methods.

Project volume

This project is offered as a master thesis work.

Contact persons

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