# Research

## Documentation/Guides

## Papers

All .pdf's in the sources directory obtained via Google Scholar. Access to IEEE Xplore sources provided by Grand Valley State University.

**A machine learning based intelligent vision system for autonomous object detection and recognition**

Abstract Summary:

This source presents a "novel fast" algorithm for visually salient object detection. It takes into account real-world illumination conditions. The algorithm performance is benchmarked on MSRA Salient Object Database and implemented on a humanoid robot. fully autonomous robots rely on perception for spacial awareness and object recognition. Overview of their system is as follows: some unknown object is learned by extracting its features. Then, any future objects will be recognized. Overall, this system is explained in two parts: image capture and segment image units. The first construct a saliency map where regions of the images are highlighted as important. As more and more images are captures and processed, a kind of "visual memory" is kept on-line the system for future referencing [1].

[2]

**A General Framework for Object Detection**

Abstract summary:

The purpose of this paper is to showcase a general trainable framework for object detection in static images. These images contain many different classes of objects. The algorithm uses statistical analysis based on the wavelet representation of an object class (?). The model learns object classes as subsets. A face detection dataset is used to benchmark this approach as well as providing a motion-based solution for video purposes.

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**Emergency Vehicle Detection**
**Real Time Machine Learning Based Car Detection in Images with Fast Training**

abstract summary:

The purpose of this paper is to demonstrate reliable object recognizers from small data sets. Their learning algorithm (AdaBoost novel variant) builds a strong classifier by incrementally training weak classifiers once with no changes to their weights. Their experiments show a very accurate model that can recognize cars accurately in real time with fast training. [14]

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