Master's Thesis

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Preface

Reading Guide

Tables, code listings and figures are numbered sequentially within each chapter. Citations are written as [x] where x denotes the reference number used in the bibliography. Code classes and functions are written as `class` and `function()`, respectively. Additional files have been uploaded to the AAU Digital Exam.

Christoffer Bøgelund Rasmussen

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1 Introduction

1.1 Initial Problem Statement

Object detection is a fundamental area of computer vision that has had a great amount of research over the past decades. The general goal of object detection is to find a specific object in an image. The specific object is typically from within a pre-defined list of categories that are of interest for a given use case. Object detection generally consists of two larger tasks; localisation and classification. It is assumed that the objects of interest are not already located in the image and as objects can vary in number of pixels depending on factors such as distance and scale, objects must be both localised in an image and classified accurately. Localisation is typically done by with a bounding-box indicating where a given object is in the image. However, other methods such as objects' centres and closed boundaries can also be used. Not only is object detection an important task in localising and classifying, it is also a necessary earlier step in larger computer vision pipelines. For example, object detection is needed within the task of activity and event recognition, scene understanding, and robotics.

2 Problem Analysis

2.1 Object Detection

- important that object detector is translation-invariant by nature image-level classification favors translation invariance. A shift of an object inside an image should be indiscriminative However, object detection needs to localise representations that are translation-variant to an extent. Translation of an object inside a candidate box should produce meaningful responses for describing how good candidate box overlaps object CITE: R-FCN 2016

3 Technical Analysis

4 Discussion

5 Conclusion

Bibliography

Appendices

Notes