Learning

Subtitle

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Abstract

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Introduction

Chapter 1

Introduction

1.1 Background and Motivation

Cancer Cancer is, today, the second leading cause of death in the world, only behind cardiovascular diseases. **Statistics** The western (or modern) world has been in a battle against cancer, and despite a lot of new cures/innovations it is still one of the deadliest killers in the world.

colorectal cancer You can get cancer in every major organ, but some types of cancer are more common than others. For instance cancer in the gastrointestinal tract (GI) is one of the more common places to get cancer. This is just behind x, and it has a mortalityrate of x in the first y years.

polyps The colorectal cancer often starts in polyps. Polyps are, polyps do.

preventative matters and early detection A good way to fight cancer is to detect and remove it early, or some times remove areas with a high chance of getting cancer. We classify cancer in to x stages, and the stage the patient are in often determines the chance you have for survival. In general, the earlier you find the cancer, the more likely it is that the patient will survive. And as mentioned above, the colorectal cancer often starts in these polyps. A crucial stage to prevent cancer lies in the early removal of there polyps. Reports shows x about this

*4 stages maybe? *early detection *survival rate

Because of this the ability to find, and remove colorectal polyps is great for preventing cancer in the GI tract.

colonoscopy/Ontonoscopy In the most common way to look for polyps in the GI tract is to use a medical team, and perform a colonoscopy or Ontonoscopy

* methods for screening?

Something about cancer and current treatments * Increasing cancer rate * 2 main options (colonoscopy MRI) * the 3rd option * CAD ACD (computer aided diagnosis, Automated computer diagnosis) * Simulas

contribution * Simulas EIR In the last 3-4 years there have been testing and development on the pillcam project EIR. Machine learning has, through many of the earlier projects, got the detection rate for the polyps up to x%

1.2 Goal / Problem

* Now that we got a lot of tests, why not unsupervised
    * We know that we can get some results using a neural network * Can this be done unsupervised? * Can it be done in a fashion that is better than S-ML

1.3 Scope and Limitations

* Something about earlier research already got far, so the scope is mainly unsupervised deep learning. * (and how to generalise it?)

1.4 Outline

The rest of the thesis is structed as follows:
    Chapter 2 - Background
talk about cancer *talk about machine learning. *how to use ML on the pillcam video? **Chapter 3 - Me doing stuff**
Chapter 4 - Me got and presented result
Chapter 5 - Me saying result was good A+

Chapter 2

Background

2.1 Cancer

2.1.1 regular colonoscopy/ Gastroscopy

2.1.2 Pillcam

2.2 Machine Learning

Testing a cite:

A computer program is said to learn from experience E with respect to some class of tasks T and performance measure P, if its performance at tasks in T, as measured by P, improves with the experience E. Mitchell 1997

2.2.1 Tasks (other better word goes here)

- Classification

- regression

- transcription/translation

- de-noising /finding missing inputs

2.2.2 The rate of success

What is a good result, how to measure?
FP,TN,FN,TP

2.3   supervised vs unsupervised

What it means to be S/US.
Something about the kind of experience allowed during the learning process.

2.4   Unsupervised

noe med å dele i grupper?   Experience the dataset containing many features, and finds useful properties of the structures. ***Unsupervised learning algorithms*** *experience a dataset containing manyfeatures, then learn useful properties of the structure of this dataset. In the contextof deep learning, we usually want to learn the entire probability distribution thatgenerated a dataset, whether explicitly, as in density estimation, or implicitly, fortasks like synthesis or denoising. Some other unsupervised learning algorithmsperform other roles, like clustering, which consists of dividing the dataset intoclusters of similar examples.* Goodfellow, Bengio, and Courville 2016

2.4.1   Approaches to unsupervised learning

look at the subsection 2.2.1 to see what applies to the unsupervised.

2.4.2   Deep Unsupervised learning

2.4.3   more

2.5   Related work

Part II

The project

Chapter 3

Planning the project

Part III

Conclusion

Chapter 4

Results

Bibliography

Goodfellow, Ian, Yoshua Bengio, and Aaron Courville (2016). *Deep Learning*. `http://www.deeplearningbook.org`. MIT Press.

Mitchell, Tom M (1997). *Machine learning*. eng. New York.