Preparation of Whole Slide Images for usage in Neural Networks

Master Thesis

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Abstract

This is the abstract.

Preface

Hello, this is the preface

Contents

Chapter 1

Introduction

1.1 Motivation

1.2 Research Objective

1.3 About this thesis

Apart from the *Introduction*, there are 5 more chapters in this thesis.

Chapter 2 - Background defines some terminoligy and the general, required process chain which are all necessary to understand further chapters of this thesis. Furthermore, 3 microservices will be introduced in short.

Chapter 3 - Methodology gives an overview over the current state of research for each microservice, as well as best practices.

Chapter 4 - Implementation goes into further details about how each microservice is implemented and which software and frameworks were used for that.

Chapter 5 - Discussion will introduce a measurement for each microservice to measure its success. It will discuss the test setup as well as list the results.

Chapter 6 - Conclusion will interpret the Results from Chapter 5 and analyze them closer. Furthermore, it will give an idea of what steps are to be taken next in the future.

Chapter 2

Background

2.1 Definition of terms

2.1.1 Deep Zoom Image Format

The Deep Zoom Image Format (.dzi) is an xml-based file format maintained by Microsoft to improve performance and quality in the handling of large image files. Therefore an image will be represented in a tiled pyramid scheme (see fig. 2.1).

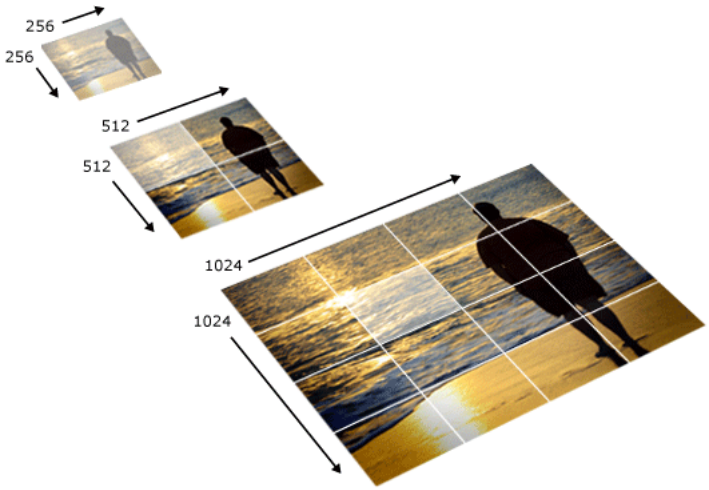

Figure 2.1: of the dzi pyramid image representation (source: https://i-msdn.sec.s-msft.com/dynimg/IC141135.png)

As seen in fig. 2.1 there are multiple versions of a single image in different resolutions. The idea behind this is, that if a user wants to see a whole picture

zoomed out or as a small thumbnail, it is not necessary to load the image file in its highest resolution. To save bandwidth a version with a smaller resolution is loaded. If the user wishes to zoom in on a specific area of the image, a version with a higher resolution is loaded. Once again, however, it is not necessary to load the whole image, since only a fraction of it will be visible. For this reason there are tiles of the image which are loaded instead (see highlited tiles in fig. 2.1) [1].

Each resolution in the pyramid is called a *level*. At each level the image is scaled down by the factor 4 (2 in each dimension). In other words, a level can be defined as an image with the resolution 2*level for height and width, resulting in a resolution of (2*level)*(2*level). Levels are counted from level 0 (1*1 Pixel) [1]. E.g. the levels shown in fig. 2.1 are:

- level 8 ($2^8 = 256$) for the 256^2 pixel image
- level 9 ($2^9 = 512$) for the 512^2 pixel image
- level 10 ($2^10 = 1024$) for the 1024^2 pixel image

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3.2.1 Literature review

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Chapter 6

Conclusion

6.1 Results

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6.3 Future tasks

Bibliography

[1] Microsoft. Deep zoom file format overview. https://msdn.microsoft.com/en-us/library/cc645077(v=vs.95).aspx. Accessed: 11.04.2016.

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