ILMENAU UNIVERSITY OF TECHNOLOGY

MEDIA PROJECT

Monocular Depth Estimation

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Final report for a media project

in the

Virtual Worlds and Digital Games Group
Faculty of Economic Sciences and Media

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Declaration of Authorship

WE/I, Christon-Ragavan Nadar and Shivam Sani, declare that this report titled, "Monocular Depth Estimation" and the work presented in it are our/my own. We/I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.
- Where any part of this work has previously been submitted at this University or any other institution, this has been clearly stated.
- Where We/I have consulted the published work of others, this is always clearly attributed.
- Where We/I have quoted from the work of others, the source is always given. With the exception of such quotations, this report describes entirely our/my work.
- I have acknowledged all main sources of help.
- Where the thesis is based on work done by ourself/myself jointly with others, We/I have made clear exactly what was done by others and what We/I have contributed myself.

Signed:

Date:

"For Frodo."

Aragorn II, son of Arathorn.

Ilmenau University of Technology

Abstract

Faculty of Economic Sciences and Media

Monocular Depth Estimation

by Christon-Ragavan Nadar and Shivam Sani

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too...

Acknowledgements

The acknowledgments and the people to thank go here, don't forget to include your project advisor...

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Motivation

1 page: Why you do this topic? Relevancy. What's the problem?

1.2 Topic Description

1-2 page(s): What are you doing?

1.3 Research question(s) and scientific contribution(s)

1 page: Hence, this thesis tries to answer the following research question(s):

- RQ1:

OR 1 page: Hence, this thesis tries to

- . . . improve [thing to improve] regarding [aspect that will be improved]
- . . . implement a system to [thing the system can do] which will be [aspect the system is better]

Chapter 2

Related Work

4+ pages

- Focus on few papers now
- Talk about different Architecture
- Early approaches
- Recent works

2.1 Early Approaches

2.2 Recent Approach

2.3 Additional Details

upsampling cound be in many parts

- Nearest Neighbore
- Bilinear Interpolation - A single pixel value is calculated as the weighted avg
- Transposed Convolution - we have weights that we learn through back-propagation.
- Recent works

Deeper Depth Prediction With FCRN [3] - Proposed architecture
- New Loss funtion Huber Loss
- End to end
- runs in real time

https://github.com/GabrielMajeri/nyuv2-python-toolbox
https://github.com/ayanc/mdepth
Some [2] [3, 2]
We use this curretn state of the art [1]

Chapter 3

Main part

3.1 Basic structure of the thesis / Approach to problem

7+ pages: Based on the related work, describe what you plan to do and how you want to answer the research question or reach your goal respectively. (Table of contents, design of application, study design, sample size)

3.2 Schedule and Milestones

1 page: Provide a GANTT diagram based on weeks.

Bibliography

[1] Ibraheem Alhashim and Peter Wonka. "High Quality Monocular Depth Estimation via Transfer Learning". In: *arXiv e-prints* abs/1812.11941, arXiv:1812.11941 (2018). eprint: 1812.11941. URL: https://arxiv.org/abs/1812.11941.

[2] Amlaan Bhoi. "Monocular Depth Estimation: A Survey". In: *arXiv preprint arXiv:1901.09402* (2019).

[3] Iro Laina et al. "Deeper depth prediction with fully convolutional residual networks". In: *2016 Fourth international conference on 3D vision (3DV)*. IEEE. 2016, pp. 239–248.