

UNIVERSITÀ DEGLI STUDI DI TORINO

SCUOLA DI SCIENZE DELLA NATURA

Corso di Laurea Triennale in Informatica



Tesi di Laurea Triennale

Data Augmentation: DeepFaceLab approach

Relatore:
Prof. Idilio Drago

Correlatore:
Dr. Elvio Amparore

Candidato:
Enrico Cassano

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The amazing quote
that I chose as inspiration
for this work

Author, *Title*

Abstract

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Italian abstract

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Chapter 1

Introduction

Chapter 2

State of The Art

2.1 DeepFaceLab

[2] DeepFaceLab is the current dominant deep-fake framework for face-swapping. It provides the necessary tools as well as an easy-to-use way to conduct high-quality face-swapping.

Face swapping is an eye-catching task in generating fake content by transferring a source face to the destination while maintaining the destination’s facial movements and expression deformations.

It is noteworthy that DFL falls in a typical one-to-one face-swapping paradigm, which means there are only two kinds of data: src and dst, the abbreviation for source and destination.

In order to achieve high-quality face swaps, GANs (Generative Adversarial Networks) are used. DeepFaceLab provides a set of workflow which form a flexible pipeline. In DeepFaceLab, we can abstract the pipeline into three phases: **extraction**, **training**, and **conversion**.

Extraction: The extraction phase is the first phase in DFL, aiming to extract a face from src and dst data. This phase consists of many algorithms and processing parts, i.e., face detection, face alignment, and face segmentation.

Training: DeepFaceLab’s structure consists of an Encoder as well as Inter with shared weights between src and dst, two Decoders which belong to src and dst separately.

Conversion: The first step of the proposed face-swapping scheme in the conversion phase is to transform the generated face alongside with its mask from dst Decoder to the original position of the target image in src. For the sake of remaining consistent complexion, DFL provides five more color transfer algorithms (i.e. RCT, IDT, ...) to approximate the color of the reenacted face to the target.

2.2 Encoder-Decoder

2.3 Stylegan2

2.4 ThisPersonDoesNotExist

2.5 GANs

Generative Adversarial Networks[1, 4, 3], are a class of machine learning frameworks in which, two neural networks (a generative network and a discriminative network) contest each other in a game (a sum zero game). Given a training set, this technique learns to generate new data with the same statistics as the training set. The generative network generates candidates while discriminative network evaluates them. The generative network's training objective is to incre the error rate of the discriminative network (pratically, it tries to fool the discriminative network).

Chapter 3

Lorem Ipsum

Bullet list example

- first point
- second point
- third point

Enumeration example

1. first point
2. second point
3. third point

Description example

first descr first point

second descr second point

third descr third point

...but you can also build nested lists

- first point
 - first point
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- second point
- third point

Chapter 4

Lorem Ipsum

A figure example, with text in line (NO CAPTION)



A figure example, with floating object and caption



Figure 4.1: the logo of UniTo

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Bibliography

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