

Unsupervised Style Transfer

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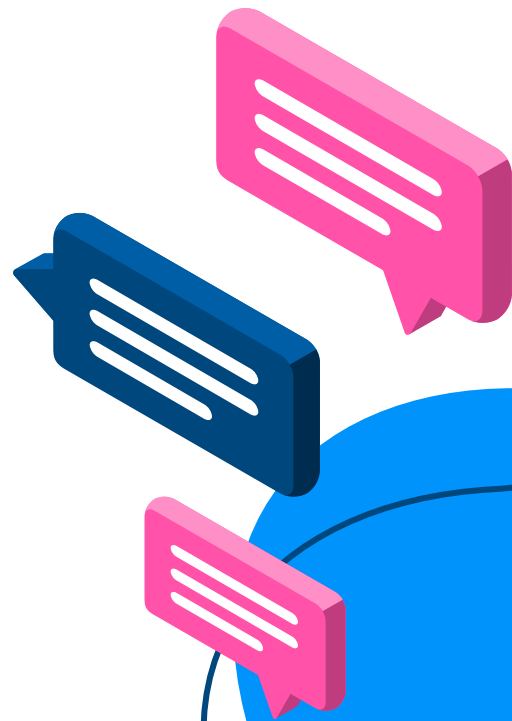




Table of Contents

1

Introduction

Problem definition,
Datasets

2

Method

Proposed model
architecture

3

Results

Some sampled
examples,
Evaluation

4

Future Work

Where to go next



1

Introduction

What is style transfer in NLP?

Style Transfer in Images

Content: Neckarfront in Tübingen, Germany



Style: The Shipwreck of the Minotaur, JMW Turner



Style: The Starry Night, Vincent van Gogh



Style: Der Schrei, Edvard Munch





The Style Transfer Problem

What constitutes style?

(Almost anything!)

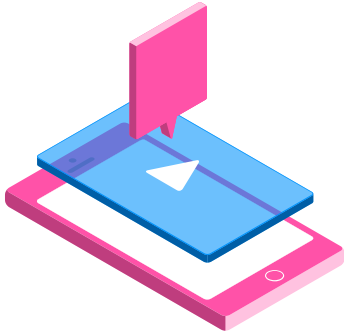
Content vs. Style

No clear definition

Unsupervised?

No parallel dataset

Our Datasets



SnappFood!
Reviews



Selected Persian
Poems

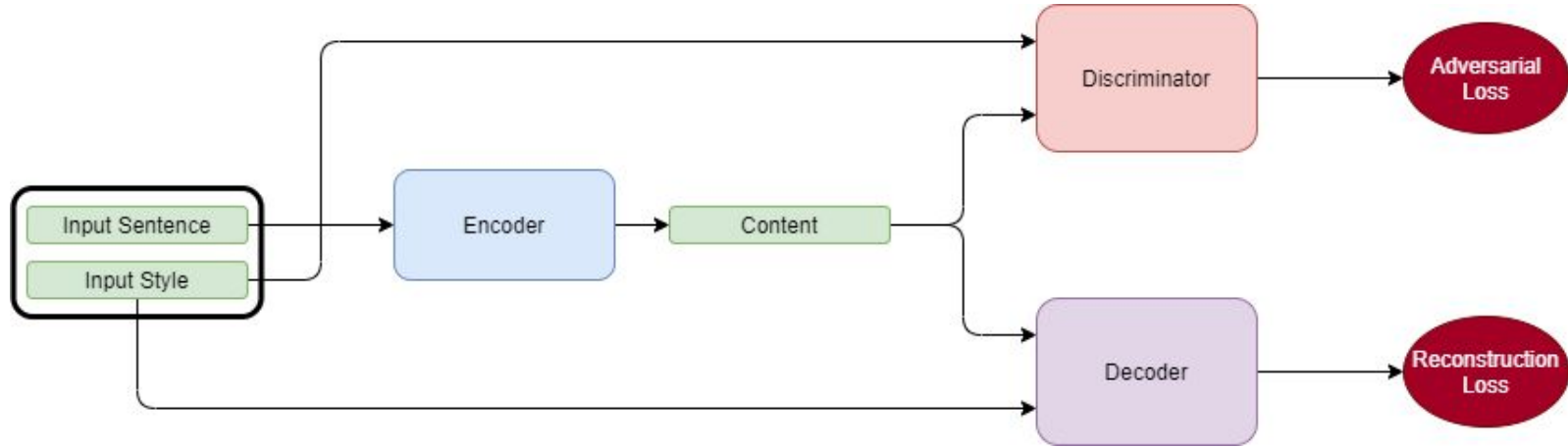
2

Method

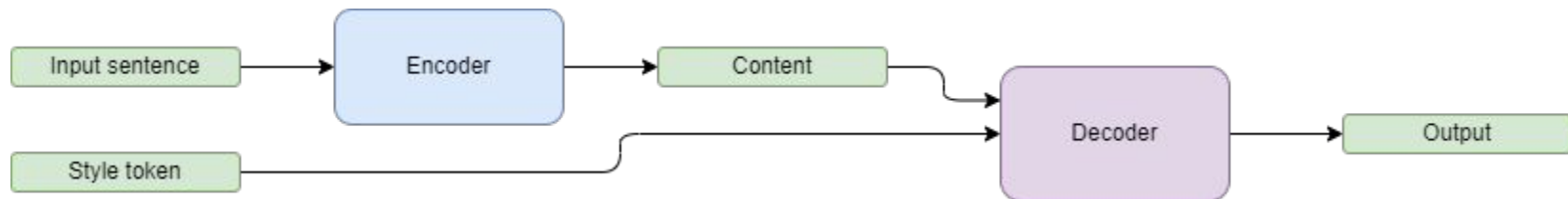
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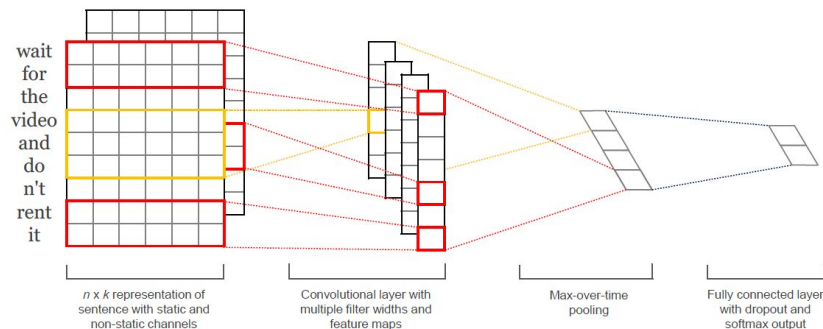
Training Procedure



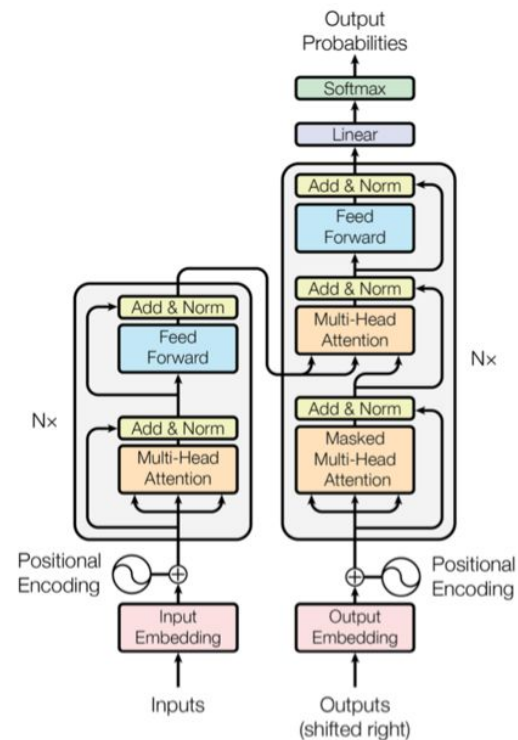
Inference



Models



**Discriminator
(TextCNN)**



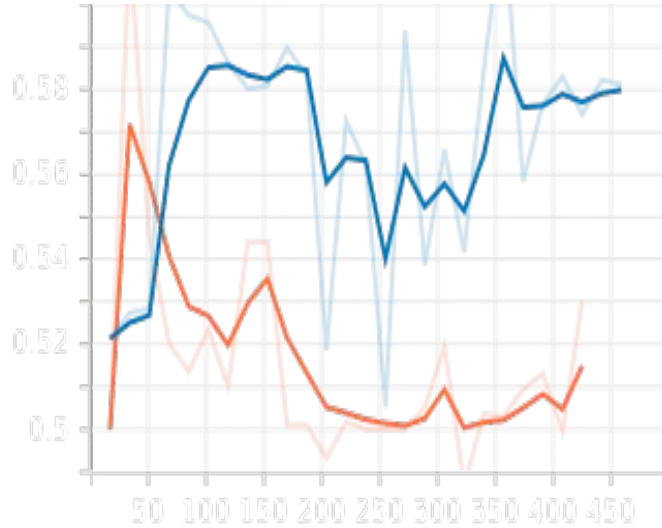
**Encoder &
Decoder
(Transformer)**



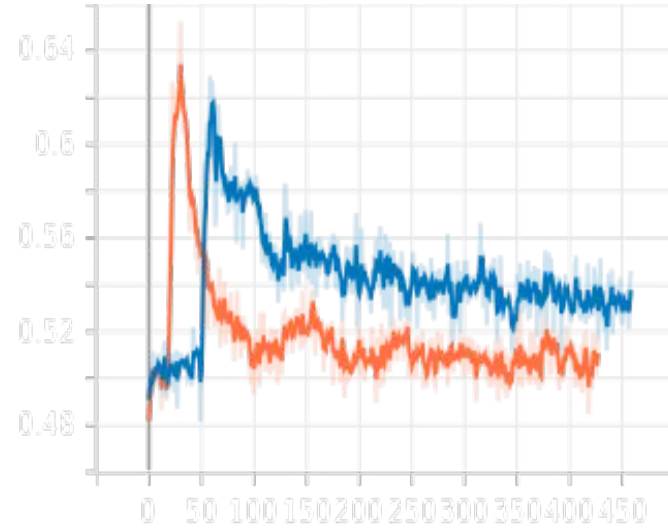
3

Results

Discriminator Accuracy



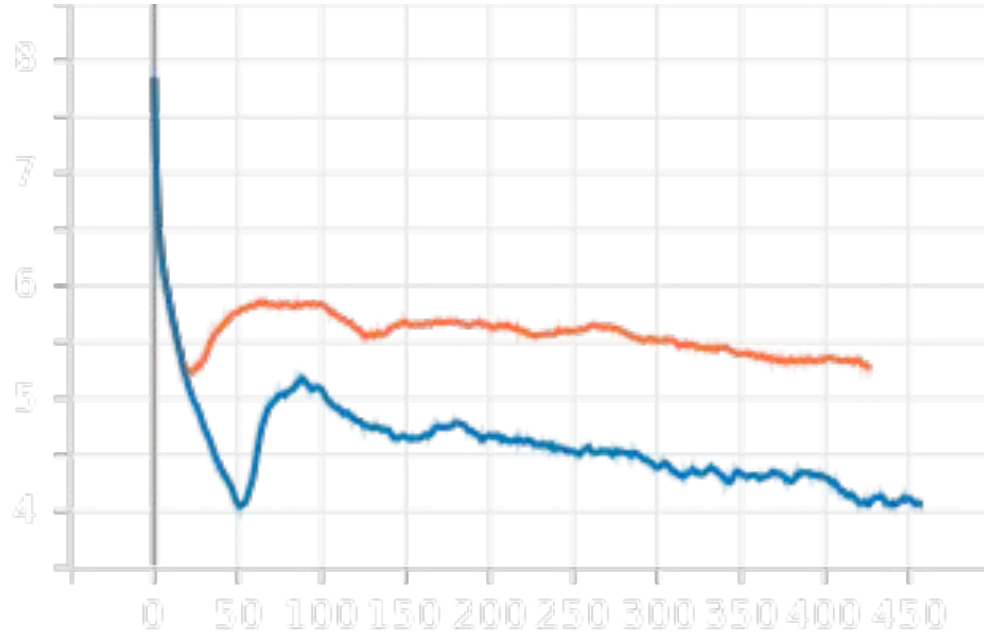
Validation



Train



Reconstruction Loss (Training)



Some Examples

**Initial
Review**

پیک خیلی بد اخلاق بود واقعا متاسفم

**Desired
Style**

HAPPY

**Generated
Review**

پیک خیلی خوب بود ممنون از پیک اسنپ فود
فوق العاده راضی بودم

Some Examples

**Initial
Review**

خوشم اومد خیلی سریع آورد

**Desired
Style**

SAD

**Generated
Review**

دیر رسید سفارش داده بودم

Challenges

The slide features a central graphic of a dark blue vertical signpost with two pink, 3D-style directional signs pointing left and right. The left sign is slightly behind the right one. The background is white with large, partial blue circles on the left and right edges.

Overfitting

Balancing the two losses
is difficult!

Model tends to favor
exact reconstruction.

Regularization,
discriminator noise, etc.

Exposure Bias

Due to teacher forcing.
We employed scheduled
sampling.

Also tested multiple
decoding strategies:
Greedy and beam search,
top-k and nucleus
sampling

Challenges



Moving Targets

Similar to DQN.
We tried freezing the
encoder while training
the discriminator (and
vice versa)
Got mixed results!

Evaluation

Generally hard to
evaluate style transfer
quality!
BLEU is particularly
useless in our case!
We could not conduct a
thorough evaluation
phase:(

Future Work

A

Professor Teaching

B

Systematic
hyperparameter search
and evaluation

C

Using multiple styles
More powerful
discriminator



Thanks

Do you have any questions?
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