

# Generating Metal lyrics - Natural Language Generation

Gleb Bychkov, Nathalie Gocht

Chalmers University of Technology  
Electrical Engineering Department



CHALMERS  
UNIVERSITY OF TECHNOLOGY

## Introduction

Possible networks:

- **LSTM**
- Variational Autoencoder
- MaskGAN
- **gpt-2** (state-of-the-art and very powerful)
  - complete model not available because of ethical issues
  - realistic fake news could be produced
  - paper: Language Models are Unsupervised Multitask Learners[3]

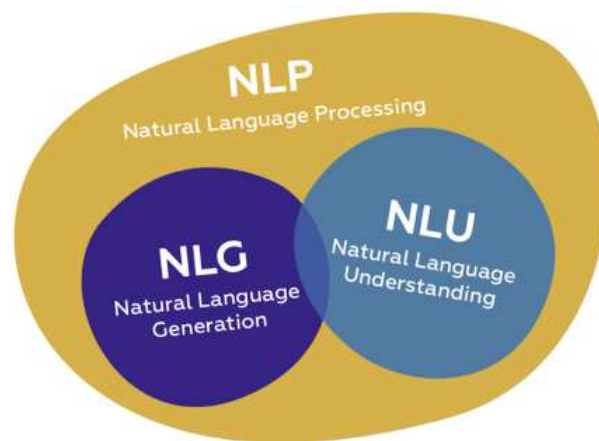


Figure 1: NLG as part of NLP

CAN YOU RECOGNIZE WHICH  
TEXT IS WRITTEN BY A HUMAN  
OR BY A MACHINE?  
YOU CAN TAKE THE QUIZ  
YOURSELF HERE:



## LSTM

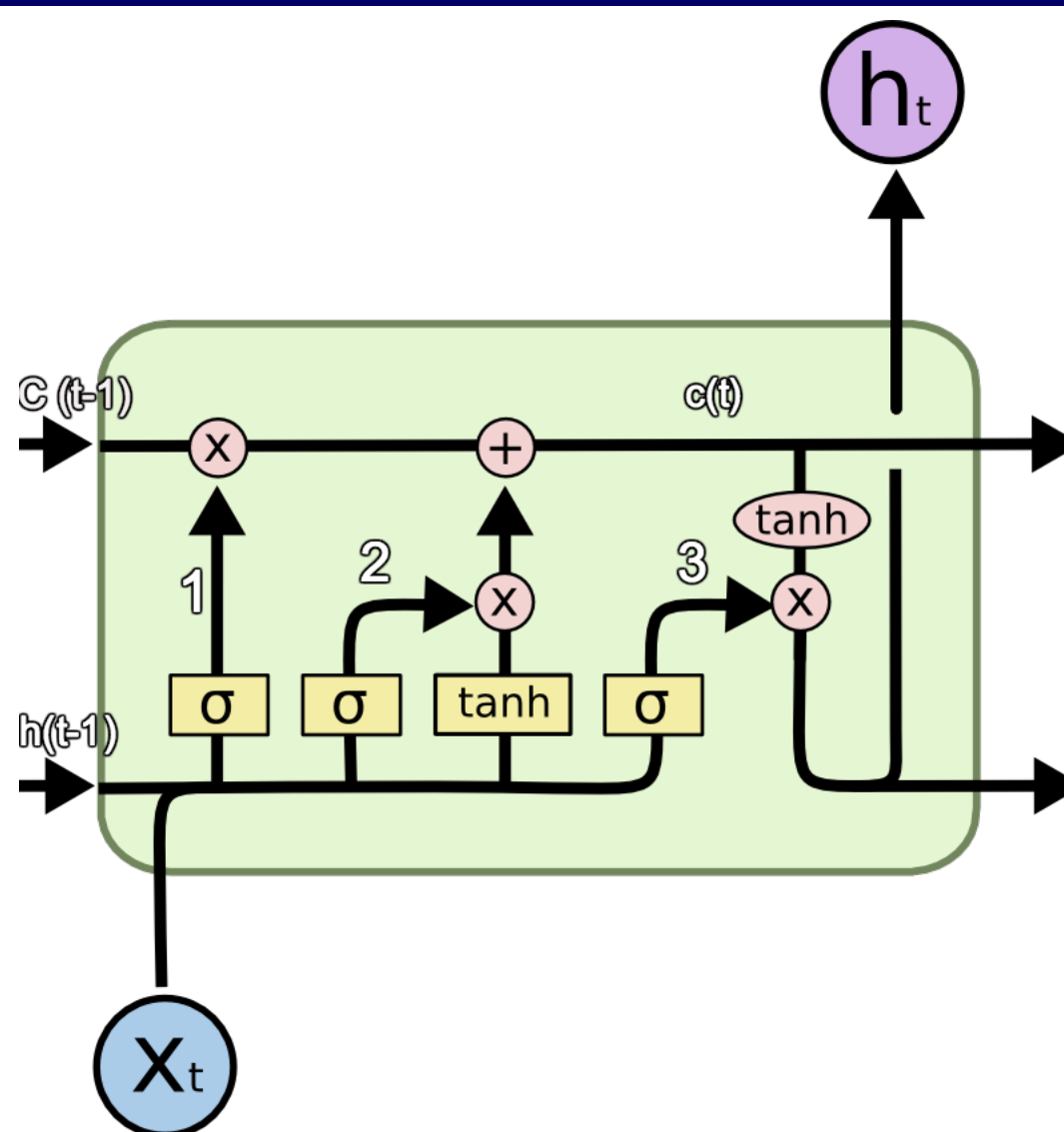


Figure 2: LSTM cell [2]

We want to present to you: The Best Of LSTM (and yes, it tends to use bad language words)

- i was told to find my hand on my feet to my head and and a bitch that could never happen to my eyes
- i'm a printhead i love you on the street ,a bitch of i'm gonna make the bitch ,smokin freya

night i know the same me  
i was told to find my hand on my feet to my head and  
and a bitch that could never happen to my eyes  
and my heart reeled with fire inside me in me ,  
my body in the mirror and a tee of a kitchen relapses of corridors. the holidays of mort  
to slake your flesh and the slimy form. bites the blood  
the blood drips on my eyes and my body flies over me. the sky is in the ground in my  
eyes. my eyes and tears. and see

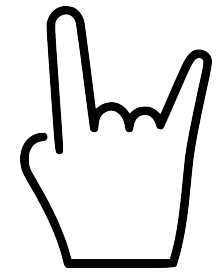
Figure 3: The funniest Best Of with a reasonable BLEU score of 0.4204

no answers in the sky of a new day and the world  
and the sun comes  
the world of my life and my soul is in your mind!  
the night has been in  
the end will never die ,  
you are in your mind !  
the only way to die  
you can't take it

Figure 4: Generated vers with highest BLEU score of 0.7511 (< 18% mistook this vers for humanly written)

## Data and Survey

- '380,000+ lyrics from MetroLyrics' provided by Kaggle
- 21338 metal songs in english



## Short example

*Humans can be convinced by synthetic text.[1]*

Current best approach: gpt-2 by OpenAI

- sequence-to-sequence encoder-decoder architecture
- uses attention mechanism

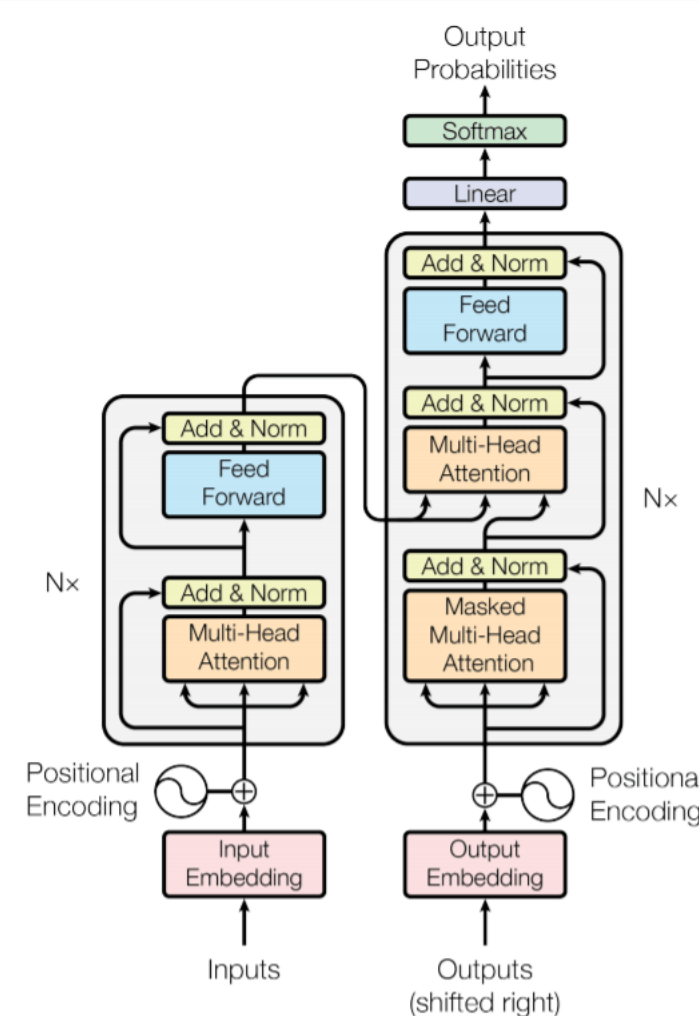


Figure 1: The Transformer - model architecture.

Figure 5: Transformer architecture with attention mechanism [4]

In our survey, LSTM generated texts were recognized very well as generated. Gpt-2 was harder to recognize, so here are the top three texts that fooled our survey participants:

the wisdom of grace  
holds me alive  
your voice is magnified  
with heavenly presence  
save us sinners  
we are so light, so wonderful  
we will become one

Figure 6: Place 1 - gpt-2,  
human score:  $\approx 58\%$ , BLEU: 0.3709

something so divine, don't you see?  
all you did was take my life  
the third wheel is full of gods  
please, don't let me drown in my pain  
please, don't let me drown in my heart  
it's how you love

Figure 7: Place 2 - gpt-2,  
human score:  $\approx 58\%$ , BLEU: 0.5573

in the hell we wait  
don't you know it is time  
when we're all alone  
in hell we wait  
don't you know it is time  
when we all fail  
in hell we wait  
don't you know it's time  
when we all fall

Figure 8: Place 3 - gpt-2,  
human score:  $\approx 52\%$ , BLEU: 0.6519

## References

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