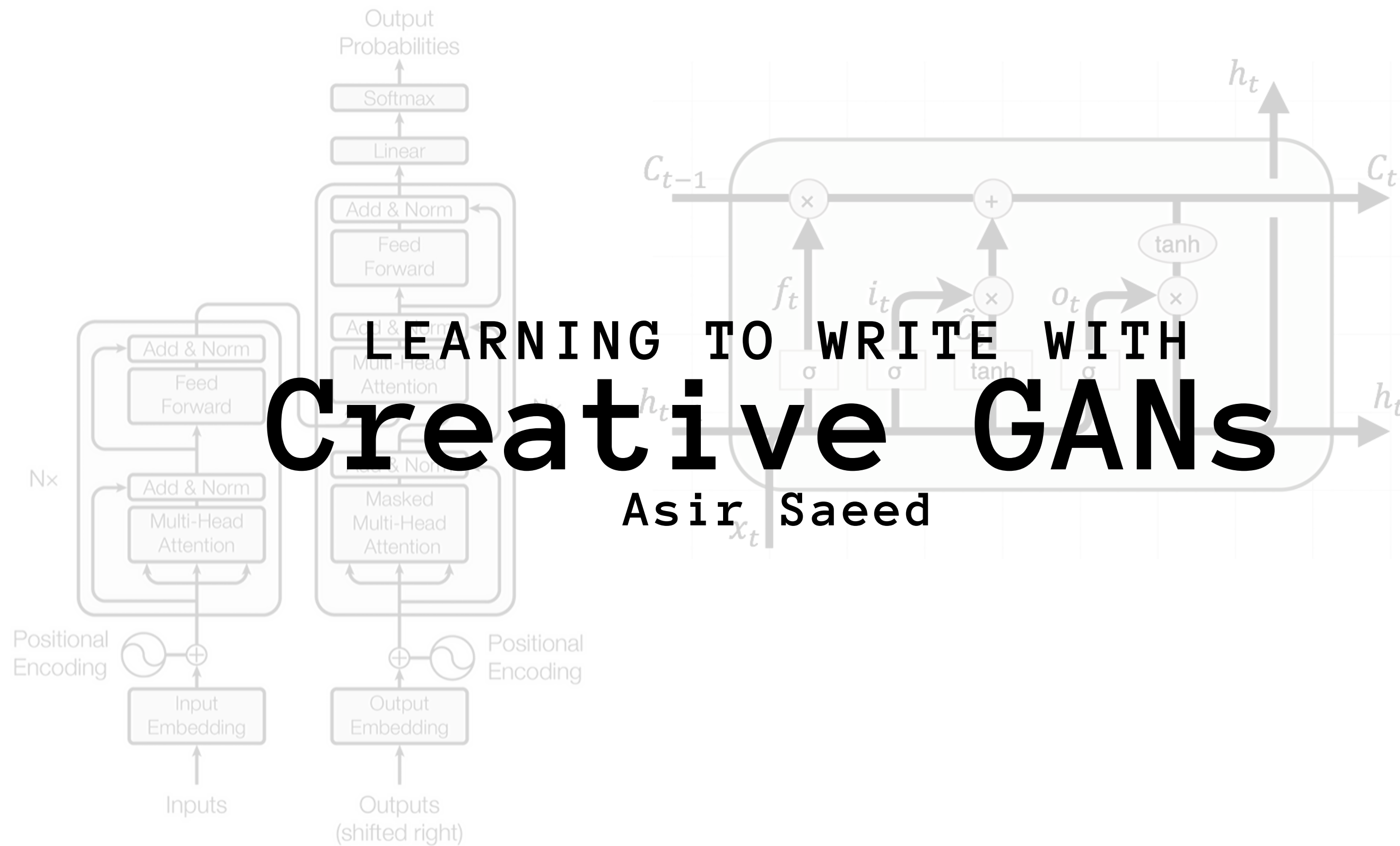
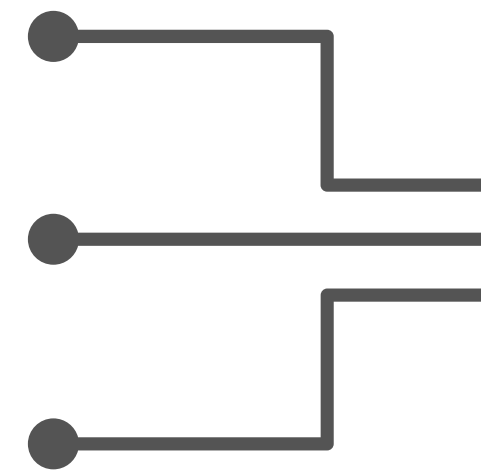
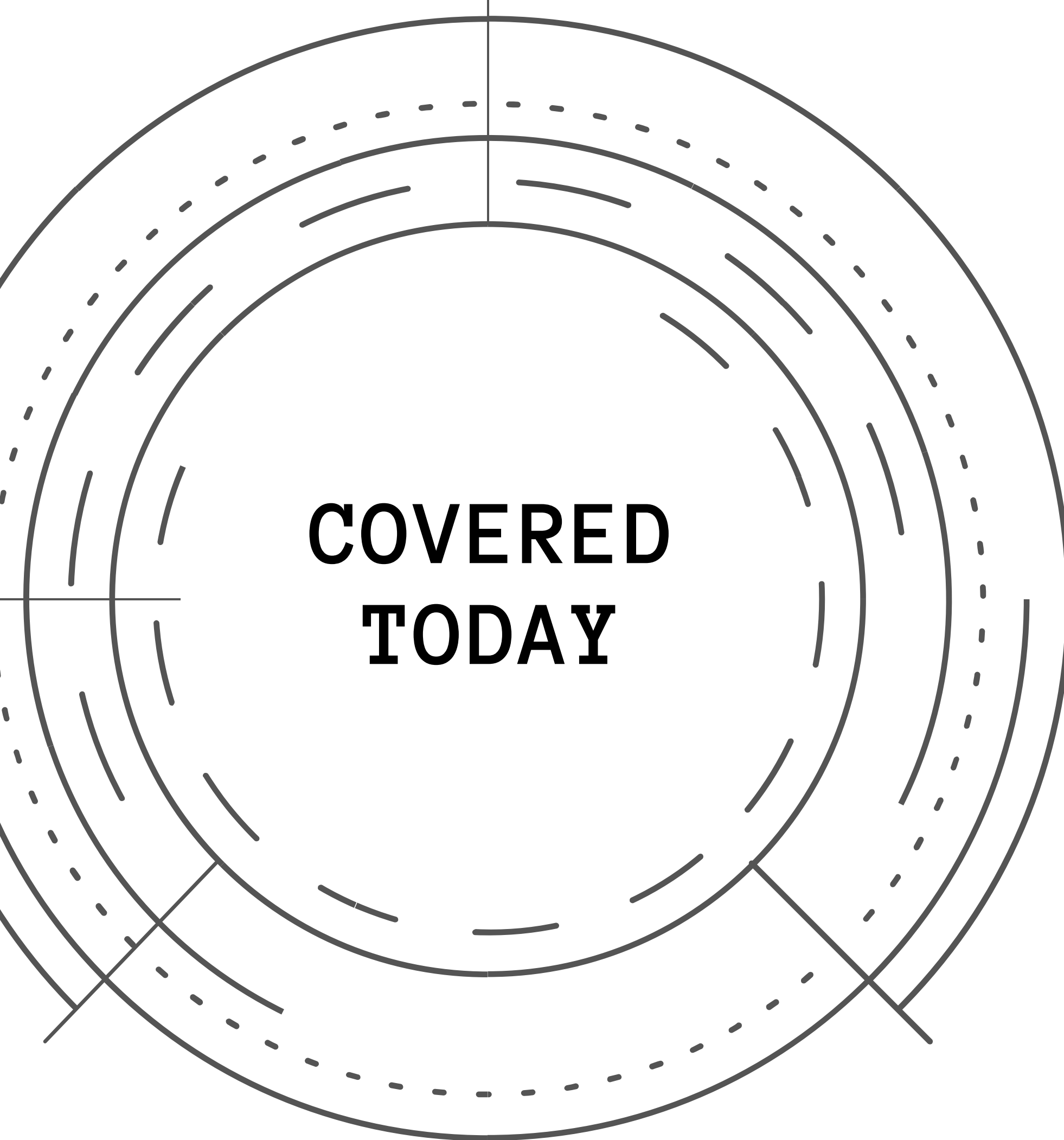


LEARNING TO WRITE WITH Creative GANs

Asir Saeed





A BRIEF OUTLINE

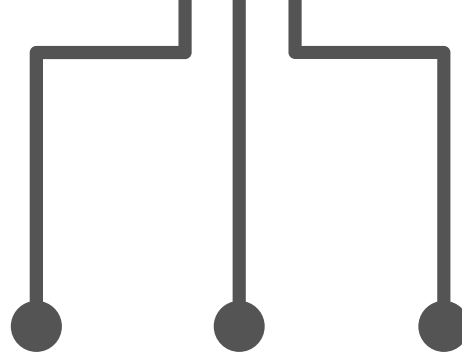
Language Modeling

Transfer Learning

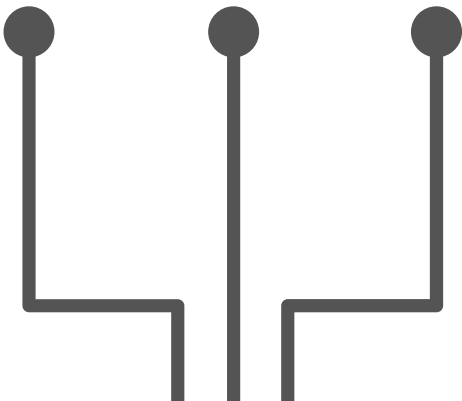
Tools, Datasets and Projects

Issues with current methods

Creative GANs

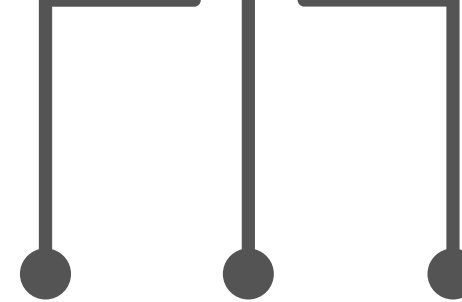
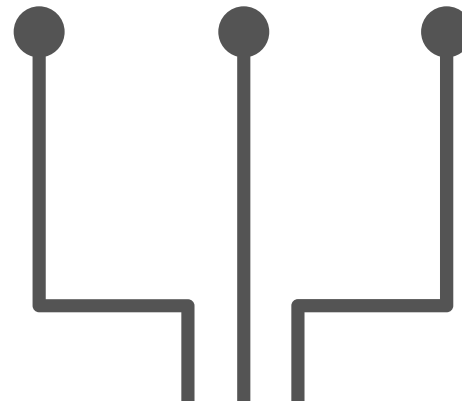


It was in your
heart. I hated
it from the
start. Only
rusty that my
heart knows.
Everything it
was in your
heart

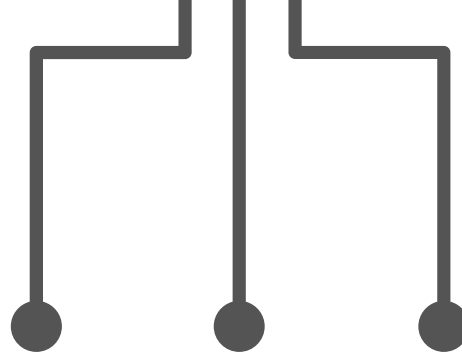


If there were
a time I knew
would be
honest And
Big was a
promise'
would be
worth that we
cried on

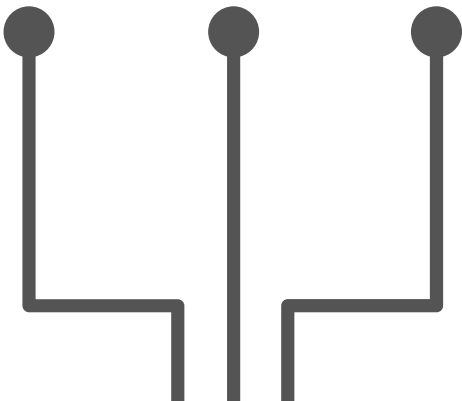
It is He Has
to leave it
Will Have to
leave it Here
we go Gettin'
tired of the
Begun Silent
music sound
of time



Where shall
we go today?
For I don't
know what I
can't see Too
much for so
long from the
right

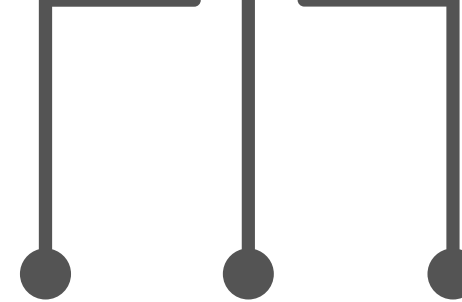
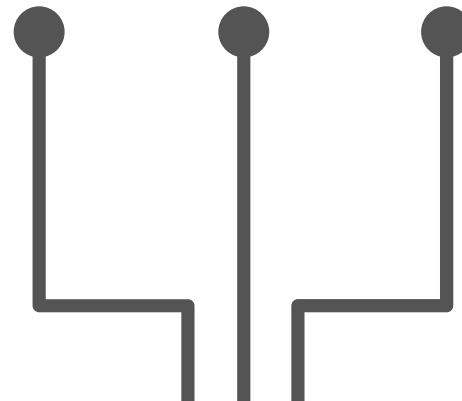


The sun is gone,
and the night is
late, the lights
are few, And the
chimneys close,
and yet the moon
hangs lonely
above the town



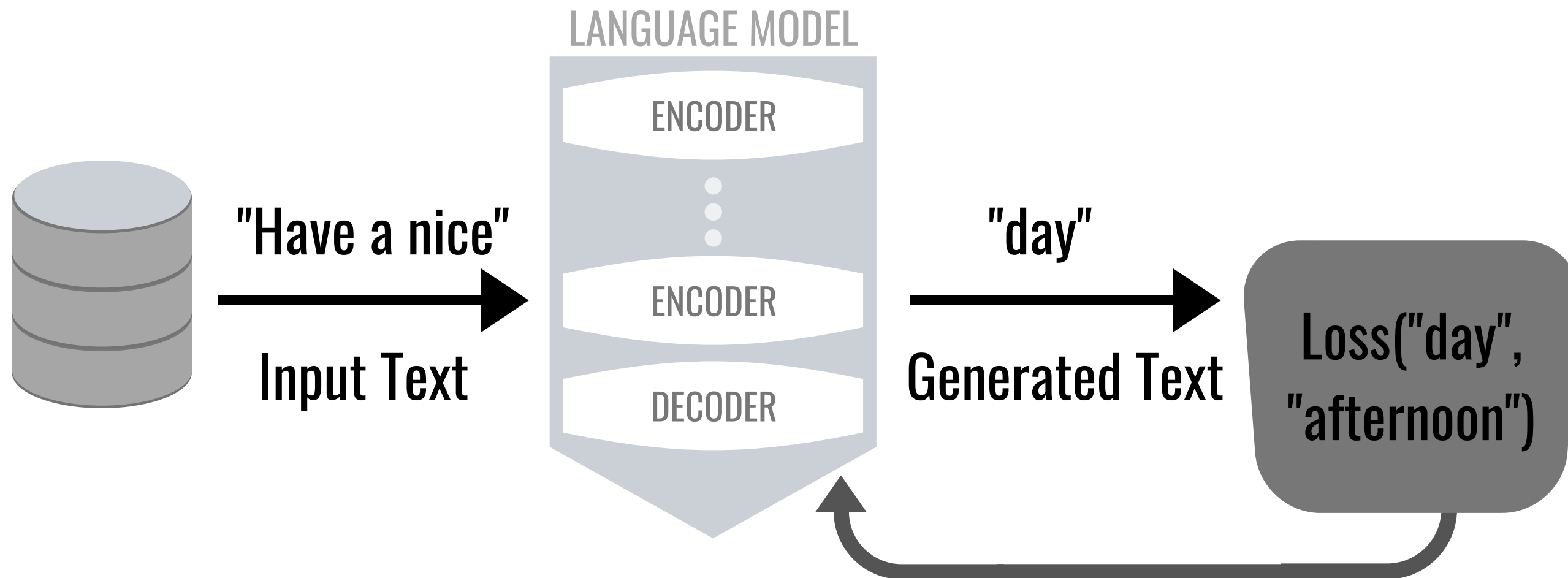
For here I
am, Weeping
alone in your
heart,
Unnoticed by
all I know.

The world was
a thing
confining,
And there was
nothing like
the Rain---



She lay under
the midnight
moon. Her
restless body
stirring.
Until the
magic morning
hour. Like
poison it
succumbs her

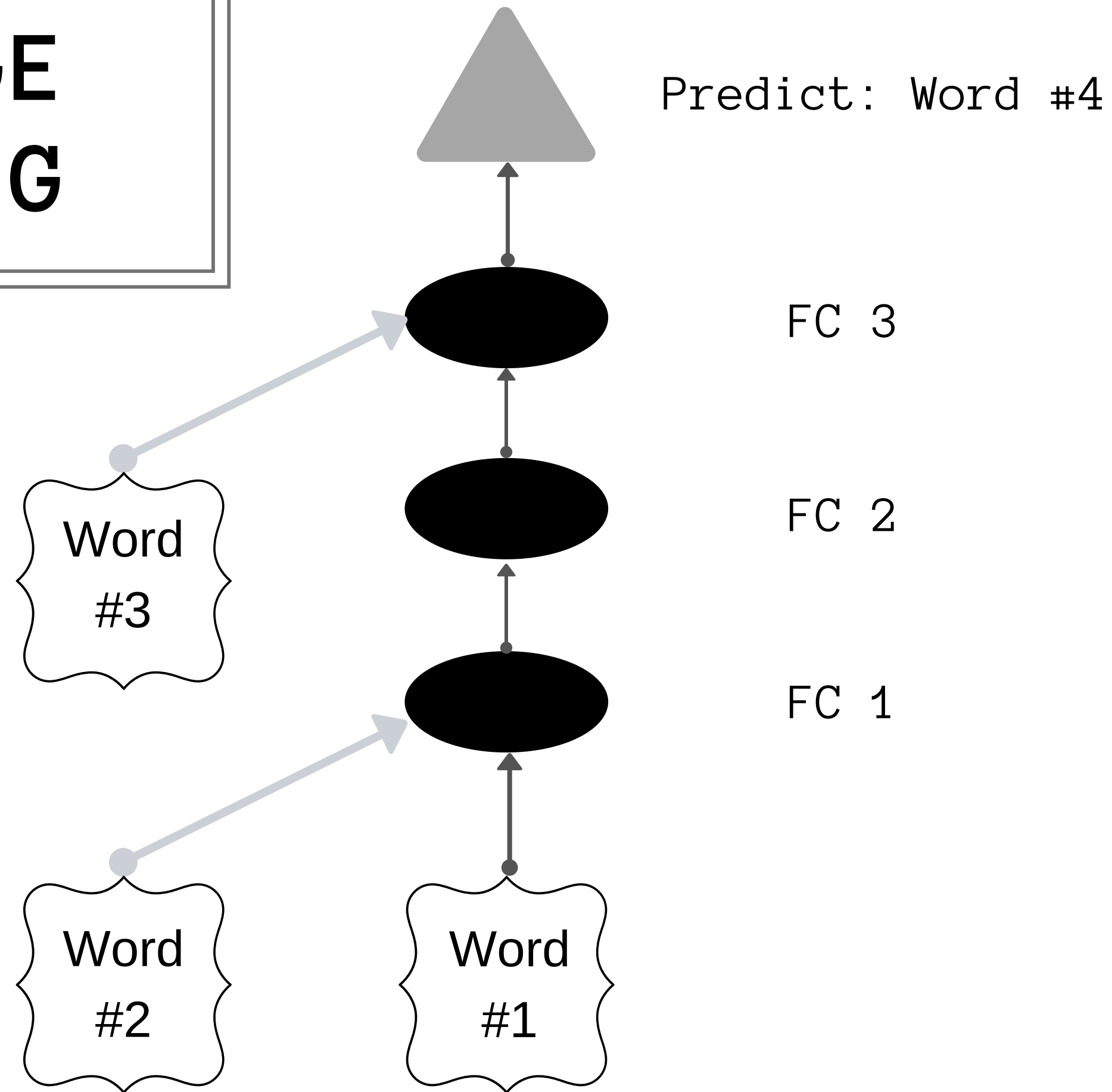
LANGUAGE MODELING



data flow →

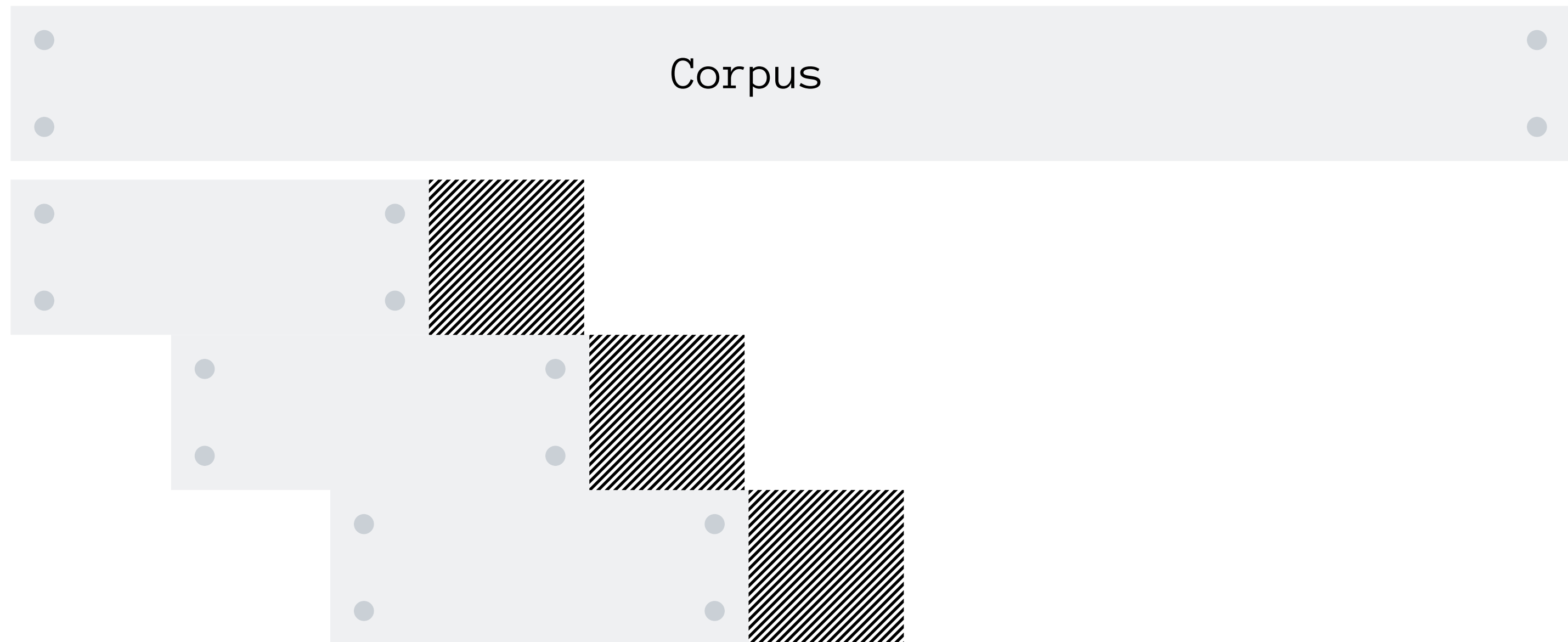
gradient flow →

LANGUAGE MODELING



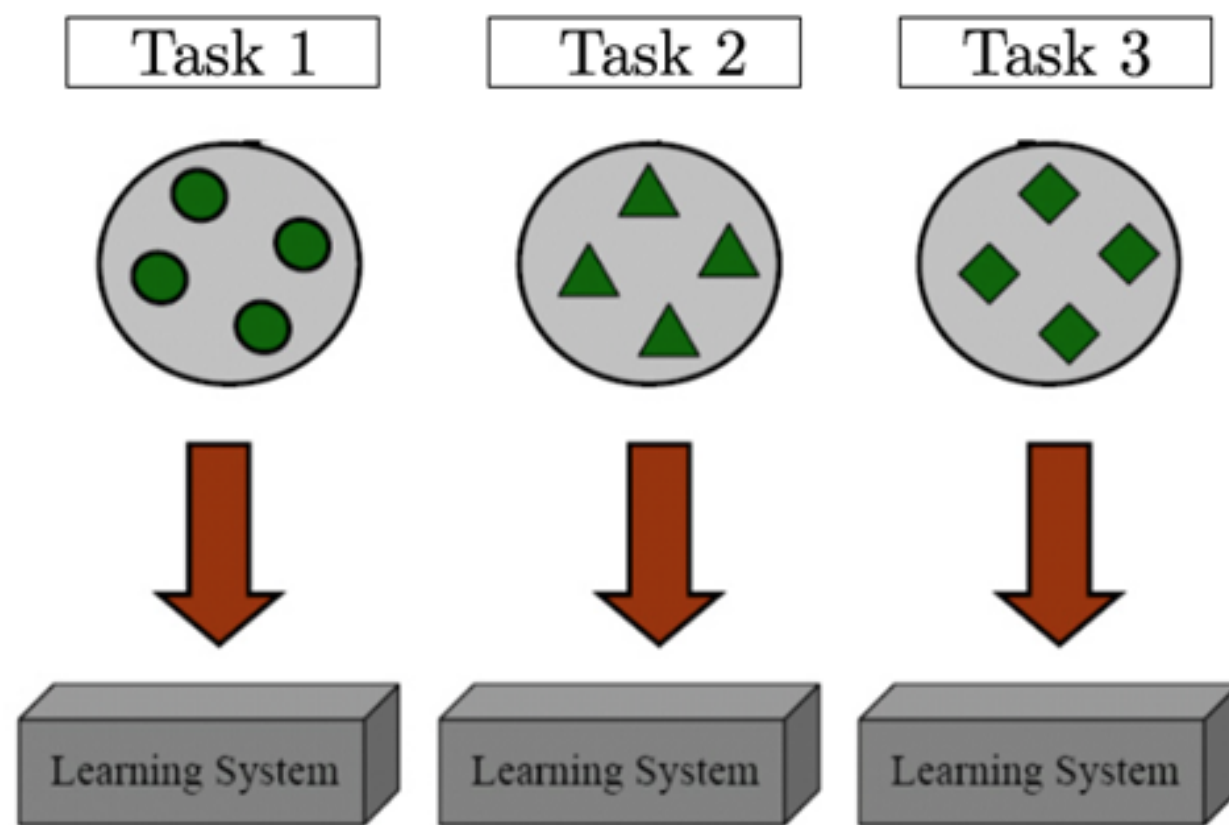
LANGUAGE MODELING

Given the previous $n-1$ words, predict the n th word and move the window



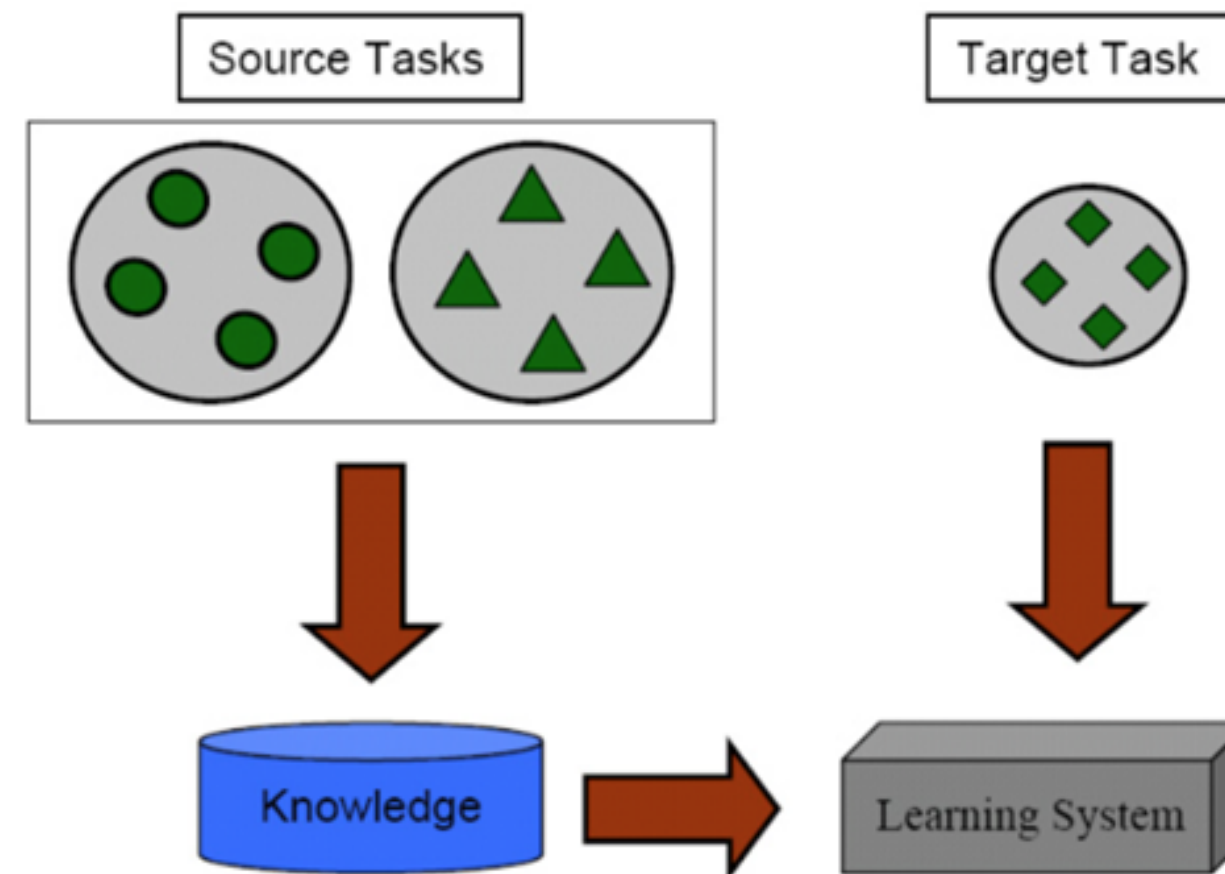
TRANSFER LEARNING

Learning Process of Traditional Machine Learning

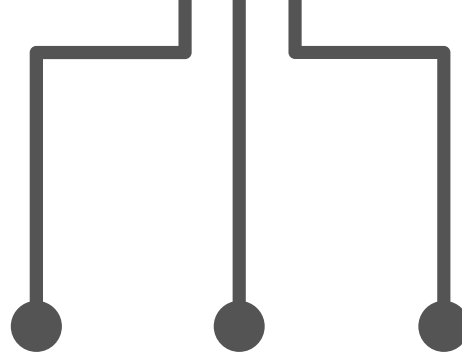


(a) Traditional Machine Learning

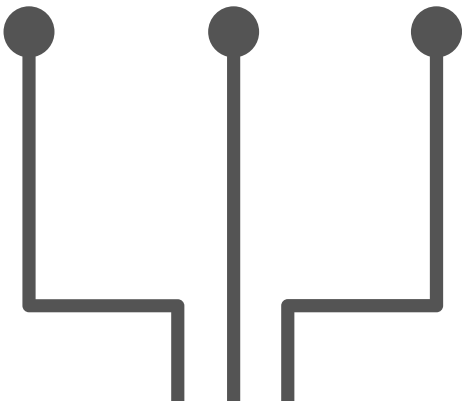
Learning Process of Transfer Learning



(b) Transfer Learning



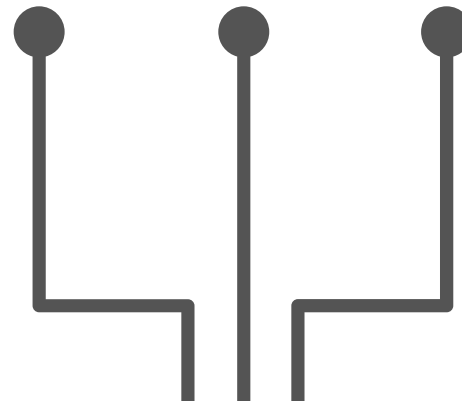
Language
modeling is
a very
difficult
task, even
for humans.



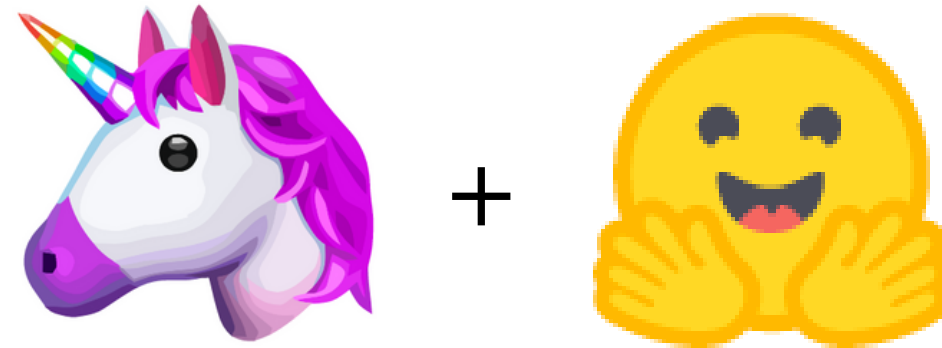
A model is
forced to
learn syntax,
semantics,
encode facts
about the
world, etc.

Given enough
data, a huge
model, and
enough
compute, can
do a
reasonable
job!

Empirically
works better
than
translation,
autoencoding
(Zhang et al.
2018)



Tools, Datasets and Projects



Tools: Write with Transformer and Transformers Library

- Training models using the Transformers Library
- Supports SOTA NLP models (BERT, TransformerXL, GPT2, RoBERTA, XLNet, XLM, DistillBERT)
- Easy integration with PyTorch and Tensorflow 2.0
- Nice UI to try things out

Tools, Datasets and Projects



Datasets:

- Gutenberg, dammit
- Gutenberg Poetry Corpus
- Aozora Bunko Corpus
- The Mind is a Metaphor

Projects:

- Articulations
- GPT2-Poetry
- Plot to Poem
- Shapeshifting: The Dream of Dagrec's Legacy

DEGENERATION

Holtzman et. al (2019)

DEGENERATION

Unlike language understanding tasks, maximum likelihood as training objective for decoding, leads to text that is bland and strangely repetitive

Holtzman et. al (2019)



THE GRAVITATIONAL
FORCE OF
REPETITION

THE TURBULENT
DISTRIBUTION OF
NATURAL LANGUAGE

THE DISCREPANCY
BETWEEN TRAIN AND
TEST TIME
CONDITIONS



Holtzman et. al (2019)

ALTERNATE OBJECTIVES



DECODING
STRATEGY: BEAM
SEARCH, STOCHASTIC
SAMPLING ETC.

MULTI-OBJECTIVE
FUNCTIONS:
DIVERSITY
BOOSTING, LENGTH
NORMALIZING ETC.

GENERATIVE
ADVERSARIAL
NETWORKS
(GAN)

GANs

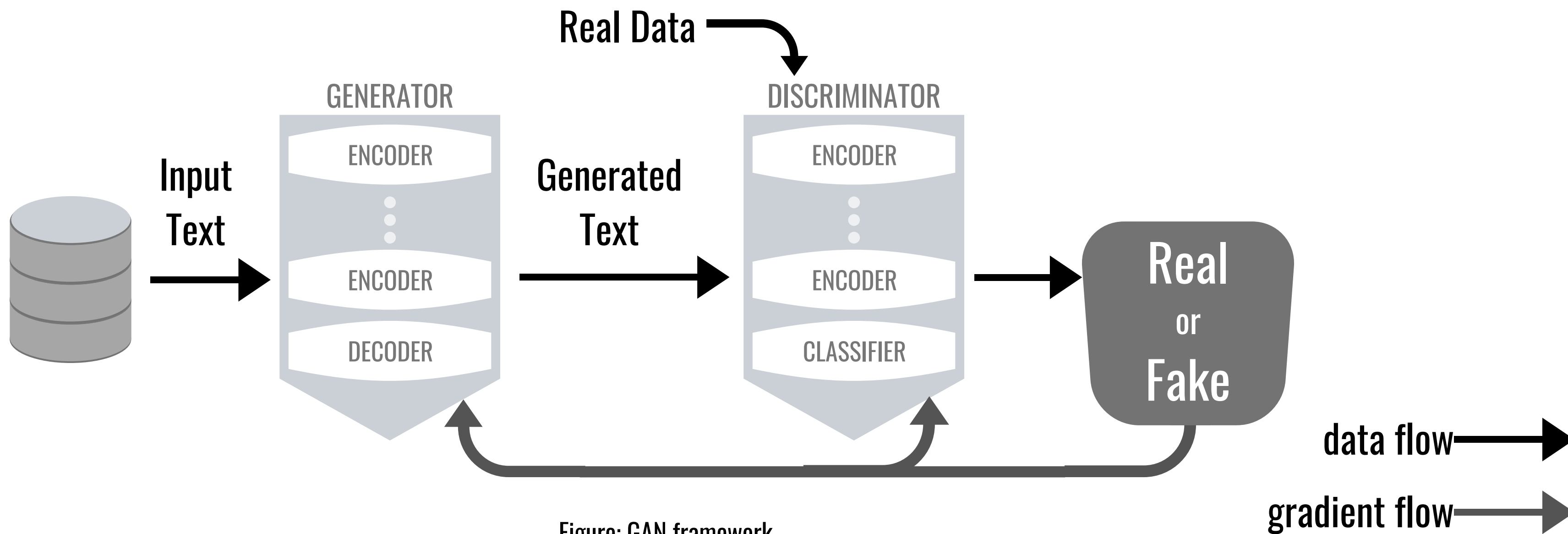


Figure: GAN framework

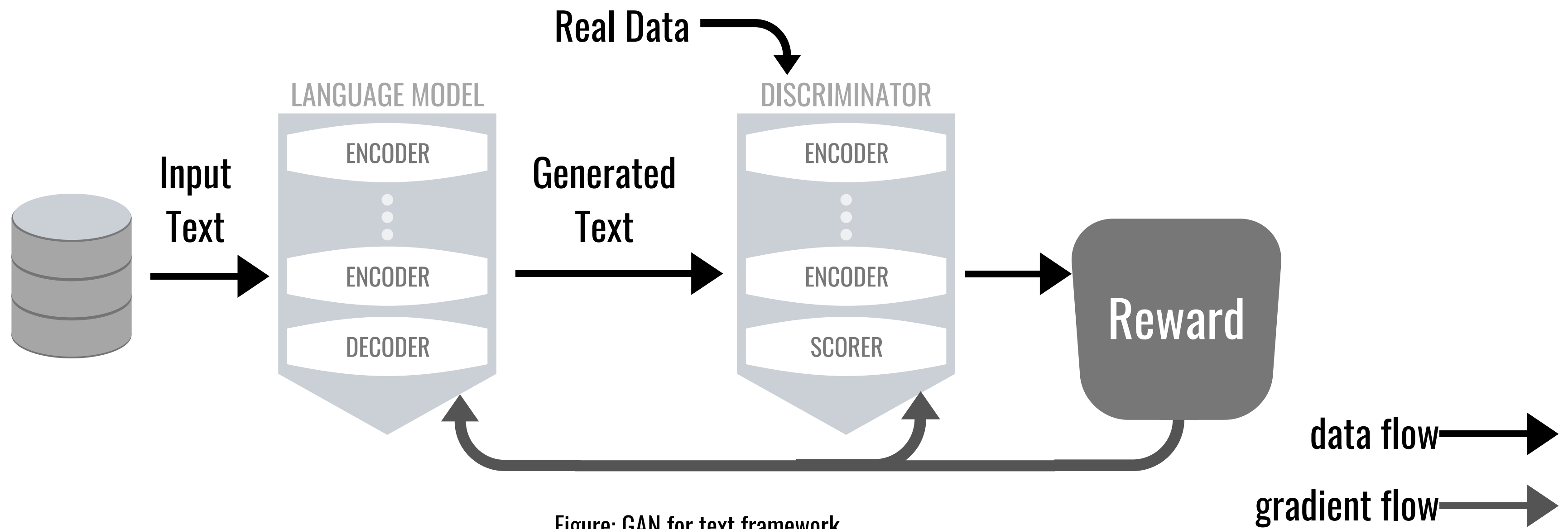
Creative GANs for generating poems, lyrics, and metaphors

Asir Saeed, Suzana Ilić, Eva Zangerle

Paper: to be presented at NeurIPS workshop for Creativity and Design, 2019

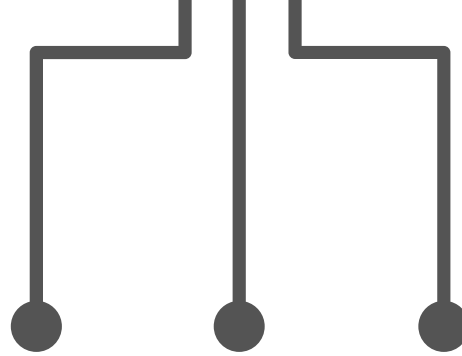
Code: <https://github.com/Machine-Learning-Tokyo/Poetry-GAN>

CREATIVE GANs

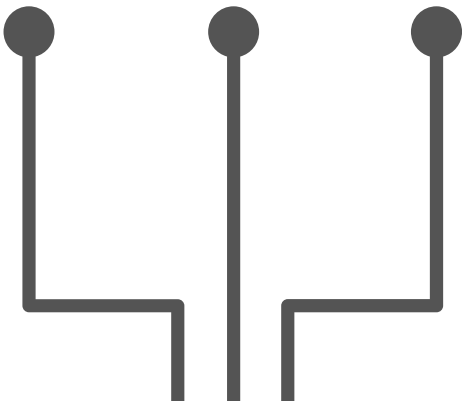


CREATIVE GANs



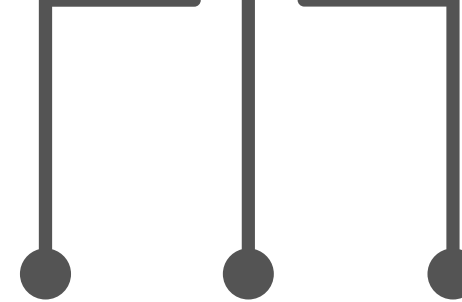
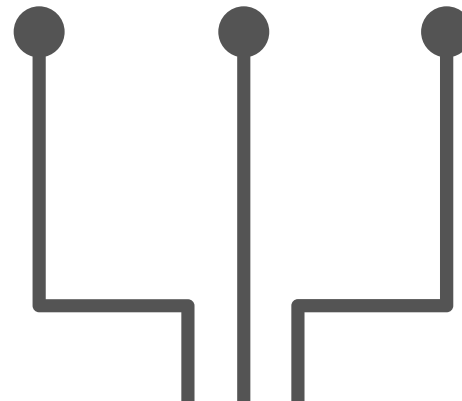


The sun is gone,
and the night is
late, the lights
are few, And the
chimneys close,
and yet the moon
hangs lonely
above the town



For here I
am, Weeping
alone in your
heart,
Unnoticed by
all I know.

The world was
a thing
confining,
And there was
nothing like
the Rain---



She lay under
the midnight
moon. Her
restless body
stirring.
Until the
magic morning
hour. Like
poison it
succumbs her

FIND OUTPUTS AT
<https://www.ai-fragments.com/>

CREATIVE GANs DEMO

EVALUATION

```
graph TD; A[EVALUATION] --> B[Human Evaluation]; A --> C[Model Based Methods];
```

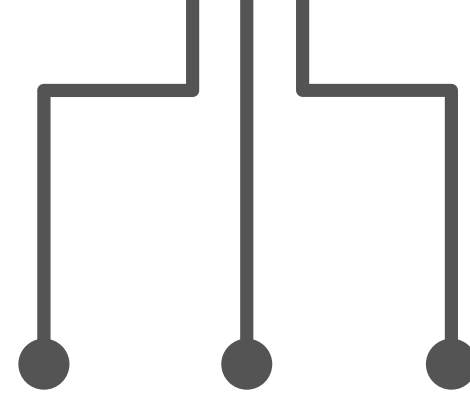
The diagram illustrates the evaluation of a model. It starts with a central box labeled 'EVALUATION'. This box branches into two main categories: 'Human Evaluation' and 'Model Based Methods'. 'Human Evaluation' further branches into 'BLEU, PERPLEXITY, UNIQUE TOKENS'. 'Model Based Methods' further branches into 'HUMAN EVALUATION' and 'MODEL BASED METHODS'.

BLEU,
PERPLEXITY,
UNIQUE
TOKENS

HUMAN EVALUATION

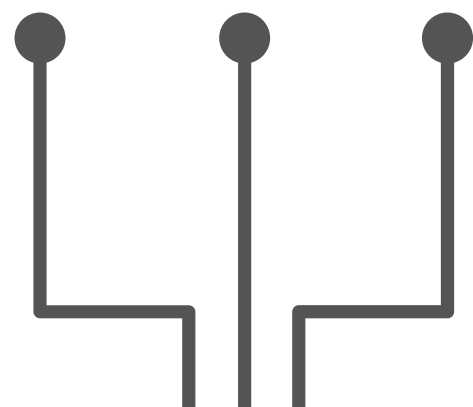
MODEL BASED
METHODS

WHY CREATIVE GANs?



POETRY IS
GENERATION IS A
SIMPLE, EASY, EASY
SOLUTION TO
PROBLEMS. THIS IS
NOT A TUTORIAL TO
GET YOU STARTED ON
WRITING COMPLEX
PROBLEMS.

GPT2

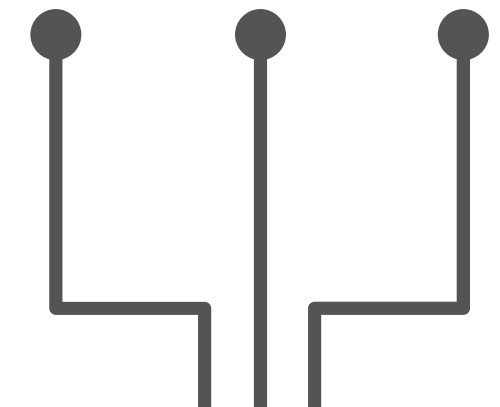


CREATIVE WRITING
IS A MAJOR
COMPONENT OF A
LANGUAGE. IN
PARTICULAR, IT
ALLOWS FOR THE
CREATION OF
POWERFUL,
EXPRESSIVE TOOLS
THAT CAN BE USED
TO CRAFT COMPLEX
IDEAS AND TO
CREATE BEAUTIFUL,
ELEGANT TEXT.

DISTILL-GPT2

LEARNING TO BE
CREATIVE IS
IMPORTANT, BUT THE
CHALLENGE IS OFTEN
LIMITED, AND THE
RESULT IS LESS WELL
ORGANIZED.

Anonymous LM





MIXED
INITIATIVE
INTERFACE



LEARN MORE ABOUT
TEXT GENERATION



AS AN ART FORM

References

- Holtzman et. al. The curious case of neural text degeneration.arXiv preprint arXiv:1904.09751, 2019
- Zhang, Kelly W., and Samuel R. Bowman. "Language modeling teaches you more syntax than translation does: Lessons learned through auxiliary task analysis." arXiv preprint arXiv:1809.10040 (2018).
- Pan, Sinno Jialin, and Qiang Yang. "A survey on transfer learning." IEEE Transactions on knowledge and data engineering 22.10 (2009): 1345–1359.
- Merity et al. Regularizing and optimizing lstm language models.arXiv preprint arXiv:1708.02182, 2017
- Dai et al. Transformer-xl: Attentive language models beyond a fixed-length context.arXiv preprint arXiv:1901.02860, 2019
- LSTM image from:Olah, Christopher. "Understanding lstm networks." (2015).
- Transformer Architecture from: Vaswani, Ashish, et al. "Attention is all you need." Advances in neural information processing systems. 2017.



THANK YOU!

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