

ART AND MACHINE LEARNING
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PROJECT 3

Hidden Green



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Concept

In Anna Karenina, Tolstoy wittily wrote, " All happy families are alike; each unhappy family is unhappy in its own way." That same observation applies even more accurately to romantic relationships. Most people are looking for love that persists and prevails. However, being in love is also about embracing the intimate knowledge of its dark side. In this project, we searched for the throes and torments instead of the cloying and saccharine in a romantic relationship. Utilizing the immense corpus from the Project Gutenberg Poetry Database (more than 300 million lines of poetry from that infamous first digital archive of literature), our LSTM learner was able to generate a remarkable volume of content that taps into these gloomy niches of romance.

Technique

The model is a variation of autoencoder (VAE) with an LSTM as the encoder [1] and LSTM or Transformer [4] as the decoder. In one word, this architecture learns a global representation of each sentence (line of input) so that it models better the style, topic and high-level syntactic structure for the sentence, compared with RNN language model that learns a latent representation for each time step. The encoder outputs a posterior distribution over the latent space $p(\mathbf{z}|\mathbf{x})$ so now for each sentence, the \mathbf{z} is no longer deterministic. The decoder can be either LSTM and a Transformer. A Transformer is described in [4]. It contains Scaled Dot-Product Attention module and Multi-Head Attention module so that in the decoding phase, it queries the previous decoding steps and the encoder output. Tokens are learned embeddings.

Process

Data Collection & Cleaning

We found a corpus of poetry from Project Gutenberg with 3,085,117 lines of poems [2]. Each line is on average 8.68 tokens long including punctuations. We use NLTK [3] to tokenize the lines so that each line now is a list of tokens. Tokens are cleaned as follows: to lower case; if only contains letters or punctuations, just return; if contains both digits and punctuation, or just digits, return `N` which stands for an arbitrary number.

We don't want to learn every token so we set the vocabulary size to three choices, 10k, 15k and 18k respectively. Out of vocabulary words are represented by `_UNK`.

We present two versions of data sets. In the original data set, each line is just a segment from a poem, i.e. one poem span several lines. Our first version, `n1`, just use each segment as a unit so that the text generation model will produce lines that are not related to one another. Our second version, `l140`, stacks lines from a single poem to one line but limits line length to be 140. In each version of the data set, we filter out the lines that `_UNK` token occupy more than 20% in the line.

Finally, we split into train (80%), val (10%) and test (10%).

Here are some examples:

vocab_size=18k, n1

snow fluttered on a _UNK and was spent ;

vocab_size=15k, l140

its energy so sinks , at last it makes but brief _UNK : for so i name things _UNK , which the heav'nly orbs moving , with seed or without seed , produce . their wax , and that which _UNK it , differ much : and thence with lustre , more or less , it shows th ' ideal stamp impress : so that one tree according to his kind , hath better fruit , and worse : and , at your birth , ye , mortal men , are in your talents various . were the wax _UNK with nice _UNK , and the heav ' n in its _UNK influence supreme , the lustre of the seal should be complete : but nature renders it imperfect ever , resembling thus the artist in her work ,

Training

We found a implementation by Texar and made some slight modification to enable it to run on AWS.

Curation

We manually selected the sentences with descriptive contents from the machine generated body of texts into a pool for the final result. Base on the curated results, especially the vision of *"there were a deaths conscious corse, and seizes him in water green and gold "* we come up with the love tragedy theme that we would further explore. The scattered symbols that appeared in the poem enrich the concept and render out the artistic environment themselves. Once the theme is decided, we collage the text with related visions to form the final poem that express various stages in this love tragedy. After the curation of the poem, we picked up keywords as the visual design inspiration and took this visual practice as preparation to the final project which we trying to experiment with text2image.

Composition

From the generated text we found some picturesque content. Some keywords are repetitively show up within the sentence. Such as sea, green, life, death, youth, love and some unusual combination of objects. "Green" brings the vivid image of young love while at the same time contains certain levels of mystery, thus we regard it to be a good base tone for our future imagery creation. And, "sea" provides the strong visual element of the gloomy and dark of the environment for a dramatic ending of the love tragedy. They oddly used pronouns reveals the juxtapositions in the romantic relationship. We selected sentences that reveals the uncertainty between the lover in the middle. Such as: *"With sword in part which seemed to gaze upon her eye. In silence , like me over dark , exhausted all my sight"* and *" pretty orphan body lies alive alone in*

king and wife." The incomplete structure of the sentence creates the keynote of the relationship yet still promote space for the imagination.

Final Result

~Hidden Green~

*-She wears that lovely collar
wherein i can meet you by the hidden green.*

*-From her confiding neck upon the throbbing body,
and more besides a lady from the distant sea
shall rise and sink with quiet peace.*

*-Youth she doe to lose perfection from the soul.
With sword in part which seemed to gaze upon her eye.
In silence , like me over dark , exhausted all my sight.
Both wanted to fear little affairs.*

*-Pinch him through the troubled sea,
but he holds her on his arm,
pretty orphan body lies alive alone in king and wife.
There were a deaths conscious corse,
and seizes him in water green and gold.*

*-Do not then him love evermore .
So shall we go to the end of the third,
Return no more.*



Selected Texts:

(Shorter Sentences) poem-v18000-n1

*I heard of the crowded elephant and holds
Her own portion of violets , by unknown
And that the ploughman put its wildest and unknown through
Breathing piercing light of care
A certain bark up the world should hear
Nor could she cry , and cheeks aside
Is sweeter than ever the sun
Where all the faculty we are , which flowers I live
You knew the bluebird of the grove
Turn up to the dark waters , she turn that she will fly*

*And kiss d him carefully with bitter bread
Now said no more
And deeper the grave lands have vanished*

*To thy gracious land confessed
When from the church 's side I slowly clashed into unknown
Prepare him beautiful in our fraud
For panting like a wasp
Or some deep supply of unknown frogs
I was in the wicked youth , yet saw
The sea and moan and the ocean
There were a deaths conscious corse , and seizes him in water green and gold*

*To sea after troy their conquest is far
Cedar and rescue his eyes , the sky
He passed once , as drunk rogero high prone in hand
Past the sandals for your new
The soul that she sang to him
He reached him out in hips
Of ancient living unknown round the highlands
I heard of the crowded elephant and holds
That I have suffered
To fetch with ice and men , and left again
Of lovely virtues ran
The marvelous cell , and his art
We are gazing to dance , the pigs and make their sport them
Still at our dreary depths that grow*

*Nor to behold if she lay , how _unk lying upon the shore
Pinch him through the troubled sea
Had many a hired nun regard to see a lady fresh and gay
And also her breast back from the water it did soften
He answered his honest might
And his face was wild and black in its unknown
Come back ! The land of unknown is the sea !
When I walked below by moonlight ; but I know it plain the power must be but to be going to go above*

She wears that lovely collar wherein I can meet you by the hidden green
Pretty orphan body lies alive alone in king and wife
Of course the unknown how the dead was sinning you
And the sobbing sound of voices lament the clouds of love and sadness .
And they sang , as you can see , till as a day approaches .
The other maidens with their touch to one unknown
All the hearts were yours , " whispered , `` now of all we love ,
Go to the starry unknown in heaven
Let me not mingle in your youth
Their meek looks of pleasure call
Bring me a something like the green , -- oh , yet , that laugh of boundless bliss !
And we might fly like paper !
He was killed in spite of a devil 's fun

(Longer Sentences) poem-v15000-l140

Last night on his good face to make a sly man , and at once in the teeth did he taste to fail , and stood in half fit by
that blood , at his side , which killed the wolf served with his poison , and duck , to shoot him his bed , or he moaned
out.

He has virtues that suffer the wisdom of the earth , one by prayer which the day of the body commands , neath her
feet because she sees them

What the cruel , blind eyes , these with lips and lips have not quenched ? Or of the flute kissed in her dream and a
_unk ? Angel , soft and white , she has given a great reward , and the curtain falls on her clear , hush of the _unk
day.

Do not then him love evermore . So shall we go to the end of the third , return no more .

If our night had been led by , and when he passed distances they would have fed pale human limbs in centuries in
heaven 's brightness , and should be blessed with peace and pain

Every fair , that needs a pretty flame which it might have to be a fool to love

Let me sing the sweet birds sing , sit on my ear , a single thing , sweet soul of hearts . On my child shall weep in my
morning lands of night to the flocks of my life . And , by life , they ll come through every quarter of days , where our
white unknown

With sword in part which seemed to gaze upon her eye , and dreamed a boys , and unknown all

This assembly was that the father smiled at the king : _ and how the mother could all the pleading friend , and who
can bear to that prison , when the cricket _unk in vain ? Thanks to the _unk of this heavy sin ; at length with wine ran
unto all that t is better heard : say , the mystery given (mine on reading -- `` oh ! I hate my deeds . " for the younger
woman is at once ,

His father's book was starting , and more where its beaming were gracious , sweet quiet and grand an old night
where his heart -- to meet the lady mabel buried her bier , -- under the loop of british fame

The bounds and fame take off her life , that passed in state 's _unk place , to death across the dead year 's slow , around that lingers poesy . Thru the blue . Far away by the white fleet , -- t is they think to my beds

A living girl turns love with a leaf , and a morning more springs _unk , like a fragrance along a hearth , intense delights for my heart . All spring is the fairest of that most gentle world . But so I can not gaze under do

And laughed the strings abruptly , licked behind with staring eyes , and turned to that the unknown was out of such a name , her little cheeks were wholly humid .

Likewise the seed that springs to vanish , spring with the livelong day ; and blossoms and it shall shame the hills well-nigh wet , and fall the bright unknown ; in the dusty lanes , the violet will shine upon the green ; there is no speck of balls for unknown in a raving spray

He made him a maiden on monday , but there was a pair , or a fashion , and he made the market one street , both wanted to fear little affairs -- I d have fair em ! Whene'er to think in that makes most approaching . Begin parts , we re hurt bar to make steel , like a man , as an average snake , who that but miss your fist

Even now the goddess from his anguish trails and answering out her breast this heart greets on that youth . Now dark , three centuries , come , come from dream of all my leaf beneath my hands thou , I have died for youth , and in a sharp desire it hath a flame of heart for here . What are thine eyes or be ?

With sad maw arrived , in silence , like me over dark , exhausted all my sight : while on the left cheek he turn d down into his bloody coat . Unknown . Why is my spirit , and thou art , that fiercer agony is lure d ? Assails ,

While thou unknown the welcome , our own mind to their blind souls will , in their silver reign , resign thy grave , and mingle in thy tomb .

But then he saw her side and down and _unk , for that day onward lies , What good joys we are , though behind need of them not ; from the unknown of poor unknown , but tired people , guarded here , was a noontide , a green leaf with my unknown ; there I met unknown 's unknown sea , born in a youthful spring , nobly born of man , to whom we could secure from city to royal man , or laws , the devils , let it fail , nor sway the horrors of the looks .

On yon tall lone world sky , there bubbled tears at last , the train brought down to death .

It thrills me and I wake and howl ! Perfumed the dance of unknown.

Reference

- [1] Bowman, S. R., Vilnis, L., Vinyals, O., Dai, A. M., Jozefowicz, R., and Bengio, S. (2015). Generating sentences from a continuous space. arXiv preprint arXiv:1511.06349.
- [2] <https://github.com/aparrish/gutenberg-poetry-corpus>
- [3] <https://www.nltk.org/index.html>
- [4] A. Vaswani, N. Shazeer, N. Parmar, J. Uszkoreit, L. Jones, A. N. Gomez, L. Kaiser, and I. Polosukhin. Attention is all you need. In Neural Information Processing Systems (NIPS), 2017.
- [5] https://github.com/asym1/texar/tree/master/examples/vae_text

CODE: <https://github.com/zxyao/late-night-cafe>

RESULT: <https://github.com/zxyao/late-night-cafe>