



# Haiku Generator from Photo

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# Introduction



- What is a Haiku?
  - a Japanese 5-7-5 syllable poem often relating to nature
- What is this project?
  - We created a haiku text generating model which is a fine tuned GPT-2 model. With this model and an existing object detection model, we can get keywords from an input photo and output a related haiku

# Previous Solutions



- 2018: *Generating Haiku with Deep Learning*
  - Jeremy Neiman uses an LSTM to build haikus from a single starting letter
- 2021: *Generating and Evaluating Japanese Haiku Poems with Deep Language Models*
  - Soichiro Yokoyama composes haikus using his GPT-2 model that is fine-tuned with a haiku corpus.
- 2022: *Deep Haiku: Teaching GPT-J to Compose with Syllable Patterns*
  - Robert Gonsalves uses his fine tuned GPT-J 6B model to generate a haiku for a given topic using text and phonemes.

# Dataset



- Haiku Dataset by bfbarry on Kaggle
  - contains 11,269 haikus scraped and cleaned from the haiku subReddit
- Haiku Dataset by Harshit Jhalani on Kaggle
  - in training the model, we used about 5,000 English haikus from the dataset gathered from multiple sources

# Proposed Method



- Cleaned our haiku datasets and used a *GPT-2 tokenizer* which is based on byte-level Byte-Pair-Encoding to encode each of our poems.
- Used the PyTorch Trainer to fine tune the *GPT2LMHeadModel*.
- We generated haikus from our nature related words and filtered out poems that do not follow the 5-7-5 syllable structure using the *syllables* Python library.
- We used ImageAI's *Image Classification* to provide us with image recognized objects in each input photo. We used these objects as keywords for our haiku generator to generate haikus related to each photo

# Evaluation Method



- We evaluate the poems generated using *BERTScore*, which was created by Cornell University scholars
- The *BERTScore* has been shown to resemble human judgment on sentence-level and system-level evaluation.
- We evaluate the haikus on the mean of the F1 measure, as this score combines both precision and recall.

# Results



- From all of the 60 nature keywords, we had 117 haikus generated. The average *BERTScore* was 0.55. Some example haikus include:

Keyword: root

root in the garden  
a small flower grows with me  
to be a small bud

Keyword: wind

winded from the sun  
the wind blows the earth silent  
the sea is waiting

Keyword: moss 🌱

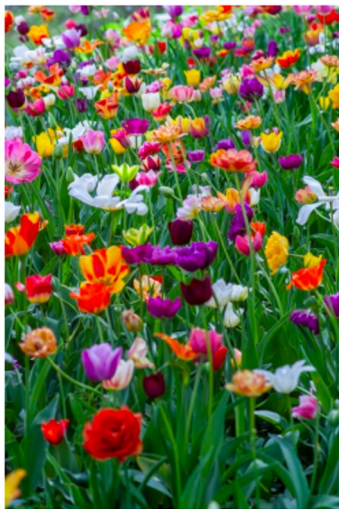
moss in the garden  
an old man in the garden  
the old man is dead



# More Results



daisy in the tree  
as the birds sing in the wind  
my heart is the same



sandbar on the beach  
the sandbar is too close  
to the ocean floor





**Thank You**

