文献survey

文献目录 与内容概括， 按时间排序

1. Chinese Poetry Generation with RNN; 2014

Based on RNN model, the model predicts the current character based on generated characters and lines, where inputs of the RNN cell is composed of the last hidden state, last generated character and context matrix, the last of which became the hotspot for further studies.

1. I, Poet: Automatic Poetry Composition through RNN with Iterative Polishing Schema 2016

Based on RNN model, the training process of this model contains several iterations, modelling the polishing process.

1. Chinese Poetry Generation with Planning based NN 2016

Based on RNN model, the model involves attention mechanism as input to RNN cell to capture the context and keywords info.

1. Flexible and Creative Chinese Poetry Generation Using NN memory 2017

Based on assumption that a generated poem should be related to some specific written poems, the model designs a memory matrix to encode the written poems, and define the similarity between current generated condition and previous poems by the cos() value of hidden state. The memory matrix is involved during decoding process.

1. Hafez: an Interactive Poetry Generation System

This model features the style control and the method of gaining feedback. It controls the style by using words classified to various styles. It designs an website to collect feedback from users and modify the parameters at the meantime.

1. Chinese Poetry Generation with a working memory model 2018

This model designs an intuitive memory mechanism to represent the context and be the input to RNN.

1. Generating Classical Chinese Poems via CVAE and GAN 2018

This model trains a CVAE model to represent the context and keywords, and takes the output as the input to S2S model. To maintain consistency with given topic, the model take the output of S2S and the given topic words as the input to GAN. The demo poem is extremely outstanding.

1. Rhetorically controlled Encoder-Decoder for modern Chinese modern poetry generation 2019

This model uses keywords to generate Chinese modern poetry. The model is S2S model. The encoder is a CAVE model encoding generated lines and conditional rhetoric. The decoder is a mixture of the RNN output, encoding matrix and memory network (similar to 4).

1. GPT-based Generation for Classical Chinese Poetry2019

The paper is a application of the GPT model on Poetry generation and gains good result on couplet generation but relatively bad one on poem generation.

1. Sentiment-Controllable Chinese Poetry Generation 2019

The paper proposes the idea that holistic sentiment and sentiment for each line play a important part in poem generation. Thus, the paper constructs a corpus of poems labelled with sentiment. The model is a CVAE model conditioned on the keywords and sentiment.

1. Deep Poetry: A Chinese Classical Poetry Generation System.

The model features the acceptance of various forms of input and a WeChat program to get access to the public. The model is a self-attention model using keywords to generate new poem.

总结

所有模型都是以keywords为输入（除11，但最后也是归结到keywords），古诗为输出，且模型的基础都是S2S。在此基础上，论文可分为三类。一类从人类作诗获得灵感，引入memory，sentiment, rhetoric的概念模拟人类作诗；一类从模型迁移和组合出发，将attention, CVAE, GAN等模型迁移到古诗生成；一类论文是从用户体验出发，开发网站或微信小程序，加入与用户的交互。

就选题来讲，跟据作诗的特点、诗的特点，各种模型从不同角度模拟作诗的过程。其中，论文2模仿古诗的打磨过程；论文4、6模拟人在作诗时先关联到几首特定的诗的特点；论文8以现代诗中的修辞为切入点建模。

就模型来讲，所有论文的模型都是S2S模型的变种，差异在于对encoder-decoder的设计。对于encoder，其作用在于将基础的current lines, keywords和可选的sentiment, memory, rhetoric进行编码，方法有最直接的对上述特征的向量用CNN/RNN整合(1,2), attention机制(3, 4), CVAE模型(7,8,10)等;对decoder， 在原RNN输出的基础上，有这些改动：引入score()函数控制词的style(5)，引入memory向量调整词的选择(4, 8)。另外有模型(7)将RNN的输入读入对抗学习模型以强化和topic之间的连接。

就用户交互来讲，论文5，11等通过降低输入限制，开发网页、小程序来增强客户体验。这些论文都是对以前成果的跟进，就不再细说。

总结来说，论文的出发点有模拟人的作诗行为、做模型迁移两大主题。通过两个方向的研究，学者均通过提高诗的连贯性、诗的主题一致性、诗的选词中的几个来最后提高诗的生成效果。

我的想法

在论文的demo中，可以注意到诗的可读性是比较差的。相比诗人的作品的通俗易懂，机器生成的诗需要通过强行的解释来意思通顺，这一点只有7，8，10生成的诗做的比较好，或许说明了生成模型的优越性。但7，8，10生成的诗依然缺乏一个很好的解释性。从直觉上分析原因，一是用关键词去概括古诗比较草率，因为关键词很难形成一个完整的故事，从而使诗有种意向贴近但却不知道整体在表达什么的感觉；二是生成的诗不能有逻辑的表达情感，换言之，诗歌生成器的情感表达都是通过意向堆砌而产生，缺少意向与意向，句子与句子间的连接。另一方面，我的思考是，可以先不做古诗生成，可以分为几个步骤，而让模型学习诗的翻译，再从翻译过渡到诗。这样或许能增强所生成古诗的可读性。

我的计划

古诗生成有两条路，一条从古诗出发，发现古诗构造、写作的规律；一条从模型出发，应用前沿的NLP模型。对前一条，或许看看古诗写作的著述会有帮助；对后一条，我想先理解下attention、GAN、CVAE的原理和实现。

我的问题

和老师的沟通交流：

多久交流，用微信交流是否合适（怕打扰到您）

老师对我的预期是怎样的，能否给我这个项目的一个规划

我的预期是以了解这个领域为主，对发表成果并没有奢望；

科研相关：

一篇论文没有呈现的但是做了的内容有多少，具体是什么。

科研的流程是怎样的？具体来说，我该从什么方向思考问题？CS角度/问题角度。我该提出多少模型？

我该对模型理解到什么程度？原理+手动写一个 / 掉包

能否给我一些操作上的帮助，比如爬虫、模型实现等