Machine Learning

课程大作业

Fall 2021

Instructor: Xiaodong Gu

任务

三选一

- 实现课堂上讲解的AI作诗系统
- 实现基于卷积神经网络的图像分类系统
- 阅读AI论文, 汇报文献并写体会(如创新点及思路)

团队任务：

- 1-3名组员
- 其中一位组员提交
- 文件名SID1_NAME1_SID2_NAME2_SID3_NAME3.zip

截止日期：

2021年12月31日

AI作诗

- 任务：

参考**https://gitee.com/wannabe-9/LSTM_poem1**

实现AI作诗系统。使用同样数据集，调试代码并进行调参实验。最后对生成的诗句样例进行展示。

注意：示例代码已过期，需要修改以适配新版本PyTorch，建议参考原始代码重构系统。

AI作诗

- **提交：**

- 代码及运行说明
- 实验报告。包括但不仅限于系统设计、训练过程（如loss曲线）、调参实验及结果（不同参数下的精确度）、诗句展示等。

系统设计
- 模型设计
- 训练方法

实验结果
- 训练过程 （如loss曲线）
- 调参实验及结果 （如模型在不同超参数下的精确度）
- 诗句展示

AI作诗

- 评分：综合评价功能、质量和工作量

功能：

代码无法运行

能完成功能、鼓励尝试更好模型

质量：

生成内容无意义、报告质量低

生成诗句、报告完整思路清晰

工作量：

直接提交示例代码

显示出对代码有理解、重构、或改进

CNN图像分类

丁老师布置

deadline晚2周

文献阅读

精读一篇自己感兴趣的AI论文，提交一个论文汇报。

要求：

- 来自顶级会议(ICML, NeurIPS, ICLR, AAAI, IJCAI, EMNLP, ACL, ICCV, CVPR, ECCV, NAACL等)
- 发表于近3年（2019及以后）
- 除了汇报的论文，可能还需要阅读若干相关文献。

文献阅读

提交：文献汇报ppt,

内容包括：

Background
Related Works
Approach
Implementation Details
Evaluation
New Thoughts (Limitations, Improvement, Applications, etc)
References

根据报告内容和质量评分，特别是New Thoughts

文献阅读

Background

No strict requirement. You may consider:

- Investigate the technical trend of the same topic in the industry.
- What you have known about this topic.
- Your understanding about this topic.
- …

Related Work

Important technologies (papers) for this research topic.

List 2-3 papers and briefly describe the key ideas.

Motivation

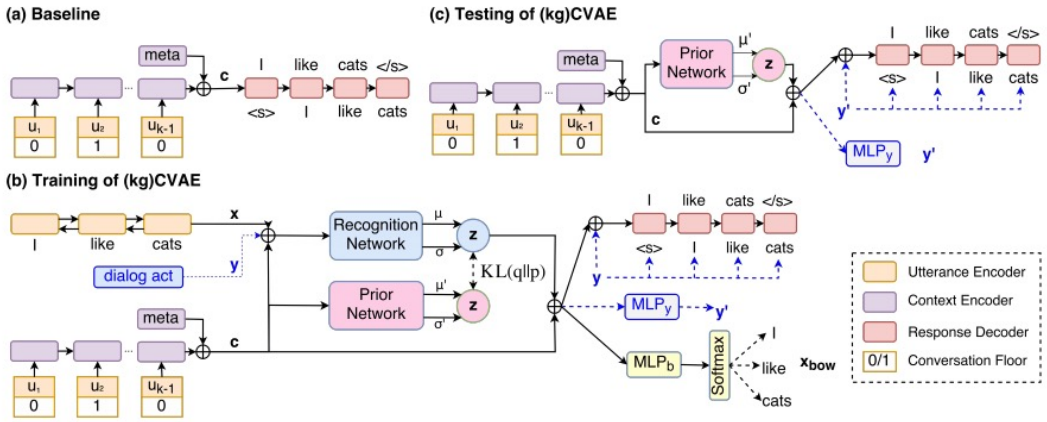
- what is the main problem of existing approaches?
- how do the authors address the problem?
- what is the key idea of the new approach?

文献阅读

Approach

Describe the approach using diagrams and descriptions (like how we introduced the Seq2Seq, Attention, Transformer, etc in the class).

For example:



Implementation Details

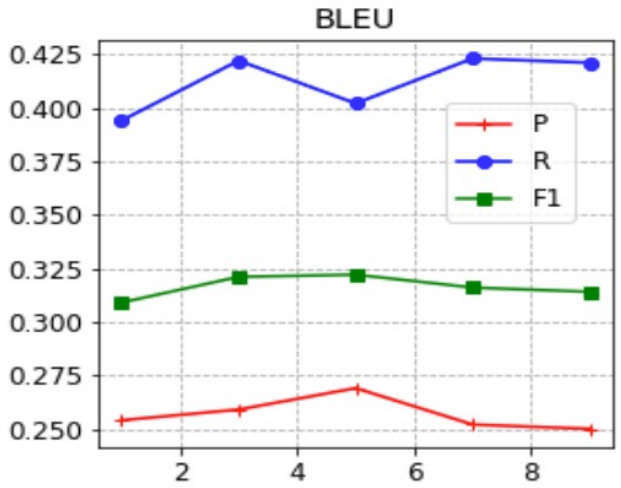
key components and algorithms (e.g., encoder, decoder, etc).

文献阅读

Evaluation

Show the experimental setup and results such as:

- data sets, baseline models, performance metrics, etc
- Tables and curves of results and the comparison of various models.
- brief descriptions about the results and comparisons.
- …



文献阅读

New Thoughts

Provide your thoughts after reading this paper, such as:

- Limitations of this paper
- Application of the technology to an interesting task?
- Your new ideas with some details

(recall how we analyzed the limitations of word2vec and then present RNN in class, the same for LSTM vs. RNN, Transformer vs LSTM, ...)

Tips

Your programs should be written in such a way that the TA can easily verify the results reported by you.

Your presentation should be clear and comprehensive so that customers (TAs) will buy (give high score to) your product.