CS 523 S2017
Multimedia Systems
Feb 8, 2017

Project 2 – Implement a Recurrent Neural Network

This assignment may be completed individually or in teams of two or three.

Part 1 – due 2/21
Part 2 – due 2/28

Choose one of the following projects to implement using the TensorFlow library:

A.) Develop an RNN that can generate a story/poem/lyrics/articles in the style of an author or genre of your choice

https://larseidnes.com/2015/10/13/auto-generating-clickbait-with-recurrent-neural-networks/
https://github.com/hunkim/word-rnn-tensorflow

B.) Develop a chatbot using an RNN that responds in the style of a particular user group or user

https://blog.kovalevskyi.com/rnn-based-chatbot-for-6-hours-b847d2d92c43
http://suriyadeepan.github.io/2016-06-28-easy-seq2seq/

C.) Develop an RNN that can generate accurate sequences of cellular automata (e.g., game of life, or CA with more elaborate rules)

https://bitstorm.org/gameoflife/
http://conwaylife.com/

(At least two groups must focus on A, B, and C.)

For a grade of *C*:

You will successfully implement example code provided in an online tutorial or taken from a code repository, etc. You will clearly document the code and explain what each line of code is doing (especially the code related to training or sampling the neural network). You will put your project on a GitHub repo with clear instructions for how to install and run and a clear explanation for what it is doing.

For a grade of *B*:

Additionally, you will create an interactive interface makes it easy for a user to interact with the NN to generate new output.

For a grade of *A*:

Additionally, you will make it clear how you have extended any existing code and demonstrate an understanding of the TF code by "making it your own" in some way. That is, your project should all demonstrate some originality and creativity in terms of the data sources, the interaction, and the output.

Part 1, due 2/21 in class

- Choose a paper, tutorial, or existing repo from which to base your implementation. (That is, get some code to run.)
- Explain some technical details of your implementation: What type of neural network does it use? How many hidden layers does it have? How does it learn or make use of image features? (That is, explain the code.)

Part 2, due 2/28 in class

- Create an interactive interface (in a Jupyter notebook, using a HTML/Javascript library, or via a Python UI) that lets a user generate a story, interact with a chatbot, seed a cellular automata, etc.
- Present your work in class, and explain how you implemented and extended previous work.
- Describe what you have learned about neural networks.
- Provide a link to the GitHub repo containing your source code and instructions for how to run it.
- Make sure that you present results as well as process, e.g., a story, conversation, or working CA.