Final Project – Defined Version

Survival Analysis for Deep Learning

Due Dates:
All parts – 5/8/2020 (Friday)

In this project, you must clearly list all the tools that you use to perform the analysis. If you use any tools/algorithms/ideas not developed by yourself, you must reference it well (both in your code and in your final report).

What you turn in must be your own work. You may not work with anyone else on any of the problems in this assignment. If you need assistance, ask in the Piazza board for this course, or contact the instructor or gradres. Please refer to our syllabus for course policy.

Fair warning: this project is still going to involve dealing with large image dataset. I was not able to find a good fit avoiding that. So please be prepared for computing power. The code could run on Google Collaboratory.

If you can accomplish this one, you should check out the

Part 1: Data and Implementation (60%)

In this project, you will build, train, and evaluate a convolutional neural network for survival analysis on MNIST. While MNIST is obviously not a clinical dataset, the exact same approach can be used for clinical data.

You will follow the following tutorial to download data and learn the step by step build, train and evaluate process:
https://k-d-w.org/blog/2019/07/survival-analysis-for-deep-learning/

What to Submit

1. You should submit all your code by the due date. Most importantly, all your code should be on github as well and provide the github repository. Good documentation is expected for your implementation and is part of your grade. Good documentation requires: (1) Readme file – how to compile and execute your code; (2) good documentation throughout all codes.
2. You should submit all screenshots (or a video) demonstrate how your code runs on your system and showing some results displayed from your terminal.

Part 2: Final Report (40%)

What to Submit

You should submit your final report by the due date. The proposal needs to be at least 8 pages (single line spacing, 12 pt font, not including citation) and include all 8 sections mentioned below.

1. Project Description
    a. The topic you chose to solve
    b. Provide a good description of the problem you are trying to solve.
    c. Hint: this section shows your understanding of the problem. I do not want to see just "copy and paste".
2. Description of data you used:
    a. Data Source
    b. Description of the data (organization, what are included in the data?)
    c. Hint: this section shows your understanding of the data. Not just "using it".
3. Related work
    a. Describe what has been done for solving this problem or similar problem.
    b. Cite any paper references
    c. Compare to how you are doing it differently
    d. Hint: this section shows you have read papers for how to solve this problem and know the related work.
4. Methods
    a. How did you solve this problem?
5. Results
    a. What are your results
    b. Hint: what you report here shows your understanding of the work.
6. Discussion
    a. Provide a discussion of your results
    b. What went well, what didn't?
    c. Hint: again, what you report here shows your understanding of the work.
7. Future Work
    a. What are some possible ways to improve in the future?
    b. Hint: this section shows your deeper understanding of the problem.
8. Conclusion
    a. Provide a conclusion of your work
    b. Typically, people discuss about what they set out to solve, what they were able to achieve (results), what needs to improve in future work (also shed light for others who might be interested in solving the same problem).
9. Citations