COMP 550, Fall 2020: Study Group 2

Wei FAN

Name Wei FAN

Student Number UdeM Matricule 20164573

Time and date of meeting 8-9pm Oct.13th

Week Number Week 2

Other students at the meeting Lin Yichen, Arghavan Sanei, Peiyong Liu, Ridwan Kurmally, Yang zhaoliang, Wei Fan

Activities and Discussion

1. we met each other on line by google meet.
2. Moderator: Lin Yichen was our moderator this week
3. Introduction: New group member Ridwan Kurmally introduced himself
4. Finish the derivation

$$L(\theta) = \sum_i N_i log(\theta_i) - \lambda(\sum_i(\theta_i) - 1)$$

$$\frac{\partial L(\theta)}{\partial \theta_i} = \frac{N_i}{\theta_i} - \lambda = 0 \Rightarrow \theta_i = \frac{N_i}{\lambda} \quad (1)$$

$$\frac{\partial L(\theta)}{\partial \lambda} = \sum_i \theta_i - 1 = 0 \Rightarrow \sum_i \theta_i = 1 \quad (2)$$

$$\text{take (1) into (2)} \Rightarrow \sum_i \theta_i = \sum_i \frac{N_i}{\lambda} = \frac{N}{\lambda} = 1 \Rightarrow N = \lambda \quad (3)$$

$$\text{take (3) into (1)} \Rightarrow \theta_i = \frac{N_i}{\lambda} = \frac{N_i}{N} \quad (4)$$

5. How to diagnose underfitting and overfitting in experiments? Overfitting: testing New data to see if accuracy drops.
   Underfitting: Increase Training data capacity to see if accuracy increases.

   How you would expect the performance trends to be in the training, development, and test sets?
   Validation is important when detecting Underfitting, Overfitting. Underfitting: Both training/validation accuracies is low. Overfitting: Training accuracy high, validation accuracy low.

   Trends of losses is the key. https://machinelearningmastery.com/learning-curves-for-diagnosing-machine-learning-model-performance/

   Test data is not helpful in this case. All about validation.
6. Chat about A1 and Reading A1, Questions about course

   A1's input file encoding is Latin.

   We discussed the reading assignment issues.
7. Next week Plan: Time: Oct.20th, 2020, 8pm-9pm. Moderator: Arghavan Sanei.
8. More to read for derivation

   https://cmci.colorado.edu/classes/INFO-2301/sp17/files/06.pdf pg52

   http://murawaki.org/misc/cat.pdf pg 9

   https://math.stackexchange.com/questions/421105/maximum-likelihood-estimator-ofparameters- of-multinomial-distribution (GyuHyeon Choi up16)

   https://drive.google.com/file/d/1RzwNDHq0uaYm3aPGWQPEH$_i LD7IkMVG_/view$