Fiche d'auto-évaluation 04

May 13, 2024

1. If you perform linear regression, how can you notice if there is co-linearity? How can you solve the problem?
2. What is the difference between a deep or shallow neural network?
3. What does forward propagation means? And backpropagation?
4. Is it true that a neural network can approximate any function? Or only a specific type? Under which assumptions?
5. What is exactly the difference between a neural network used for regression and a neural network used for classification?
6. Write the equation which describes the output of neuron q in layer l.
7. Is the output of a neuron linear or non-linear with respect to the input?
8. How are non-linearities introduced in a neural network?
9. Is backpropagation used during training or prediction?
10. Can we define logistic regression as a neural network? If yes, in which sense?
11. Write the formula of two types of loss function of a neural network.
12. Write the equation of gradient descent to minimize a generic function $u(\mathbf{z})$.
13. For what is gradient descent used in neural networks?
14. When applying gradient descent to a neural network, we compute the gradient of which function? And this gradient is computed with respect to which variables?
15. Is it guaranteed that, by applying gradient descent in neural networks, we converge toward the minimum of the loss function? And if we apply it in logistic regression? Why?
16. What is the relation between gradient descent and backpropagation? Is gradient descent needed to perform retropropagation? Or vice-versa? In which precise sense, one is needed by the other?

17. What is the difference between full/stochastic/batch gradient descent? Is this difference only concerning the training procedure or also the prediction procedure?

18. What does "epoch" mean?

19. Is it important to scale the dataset when using a neural network? Is it important only when using regularization or also without?