

Evaluating a Learning Algorithm

Bias vs. Variance

Review

Reading: Lecture Slides

10 min

Quiz: Advice for Applying Machine Learning

5 questions

Programming Assignment: Regularized Linear Regression and Bias/Variance

3h

Building a Spam Classifier

Handling Skewed Data

Using Large Data Sets

Review



QUIZ • 10 MIN

# Advice for Applying Machine Learning

1. You train a learning algorithm, and find that it has unacceptably high error on the test set. You plot the learning curve, and obtain the figure below. Is the algorithm suffering from high bias, high variance, or neither?

1 point

Submit your assignment

DUE

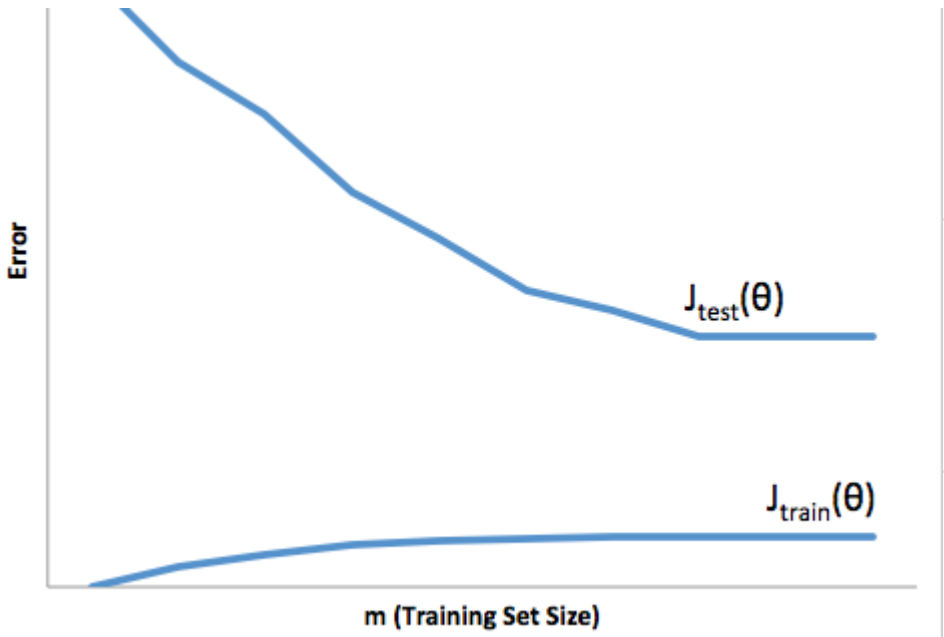
Aug 16, 11:59 PM PDT

ATTEM

Receive grade

TO PASS

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- ☐ High variance
- ☐ High bias
- ☐ Neither

2. Suppose you have implemented regularized logistic regression

1 point

to classify what object is in an image (i.e., to do object recognition). However, when you test your hypothesis on a new set of images, you find that it makes unacceptably large errors with its predictions on the new images. However, your hypothesis performs **well** (has low error) on the training set. Which of the following are promising steps to take? Check all that apply.

- ☐ Try decreasing the regularization parameter  $\lambda$ .
- ☐ Try using a smaller set of features.
- ☐ Try increasing the regularization parameter  $\lambda$ .
- ☐ Try evaluating the hypothesis on a cross validation set rather than the test set.

3. Suppose you have implemented regularized logistic regression

1 point

to predict what items customers will purchase on a web shopping site. However, when you test your hypothesis on a new set of customers, you find that it makes unacceptably large errors in its predictions. Furthermore, the hypothesis performs **poorly** on the training set. Which of the following might be promising steps to take? Check all that apply.

- ☐ Try using a smaller set of features.
- ☐ Try increasing the regularization parameter  $\lambda$ .
- ☐ Try adding polynomial features.
- ☐ Try to obtain and use additional features.

4. Which of the following statements are true? Check all that apply.

1 point

- ☐ Suppose you are training a regularized linear regression model. The recommended way to choose what value of regularization parameter  $\lambda$  to use is to choose the value of  $\lambda$  which gives the lowest **cross validation** error.
- ☐ The performance of a learning algorithm on the training set will typically be better than its performance on the test set.
- ☐ Suppose you are training a regularized linear regression model. The recommended way to choose what value of regularization parameter  $\lambda$  to use is to choose the value of  $\lambda$  which gives the lowest **test set** error.
- ☐ Suppose you are training a regularized linear regression model.The recommended way to choose what value of regularization parameter  $\lambda$  to use is to choose the value of  $\lambda$  which gives the lowest **training set** error.

5. Which of the following statements are true? Check all that apply.

1 point

- ☐ If a learning algorithm is suffering from high bias, only adding more training examples may **not** improve the test error significantly.
- ☐ If a learning algorithm is suffering from high variance, adding more training examples is likely to improve the test error.
- ☐ We always prefer models with high variance (over those with high bias) as they will be able to better fit the training set.
- ☐ When debugging learning algorithms, it is useful to plot a learning curve to understand if there is a high bias or high variance problem.

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