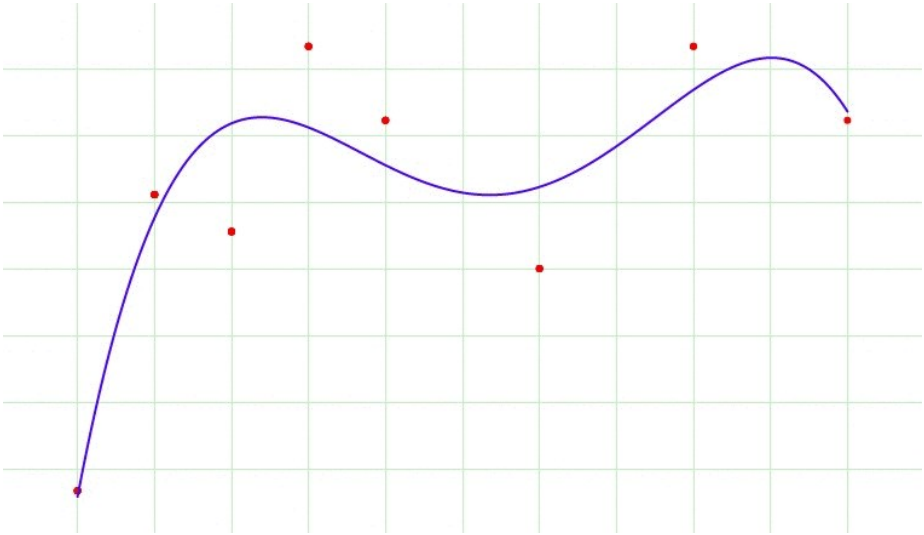
Over-fitting and Regularization

Anuja Nagpal Follow
Oct 11, 2017 · 2 min read

Machine Learning

In supervised machine learning, models are trained on a subset of data aka training data. The goal is to compute the target of each training example from the training data.

Now, overfitting happens when model learns signal as well as noise in the training data and wouldn't perform well on new data on which model wasn't trained on. In the example below, you can see underfitting in first few steps and overfitting in last few.



Now, there are few ways you can avoid overfitting your model on training data like cross-validation sampling, reducing number of features, pruning, regularization etc.

Regularization basically adds the penalty as model complexity increases. Regularization parameter (lambda) penalizes all the parameters except intercept so that model generalizes the data and won't overfit.

Top highlight

$$J(\theta) = \frac{1}{2m}\left[\sum_{i=1}^{m}(h_\theta(x^{(i)}) - y^{(i)})^2 + \lambda\sum_{j=1}^{n}\theta_j^2\right]$$

$$\min_\theta J(\theta)$$

Regularization in cost function

In above gif as the complexity is increasing, regularization will add the penalty for higher terms. This will decrease the importance given to higher terms and will bring the model towards less complex equation.

Stay tuned for the next post which will cover the different type of regularization techniques.

Machine Learning | Data Science | Analytics

829 claps

4

Anuja Nagpal

Data Scientist- Keeping up with Data Science and Machine Learning. #datascience #machinelearning #womenintech

Follow

Towards Data Science

Sharing concepts, ideas, and codes.

Following

More from Towards Data Science

12 Things I Learned During My First Year as a Machine Learning...

Daniel Bourke
Jul 6 · 11 min read ★ 2.7K

More from Towards Data Science

How a simple mix of object-oriented programming can sharpe...

Tirthajyoti Sarkar
Jul 5 · 11 min read ★ 1.4K

More from Towards Data Science

What Separates Good from Great Data Scientists?

Amadeus Magrabi
Jun 30 · 6 min read 1.3K

Responses

Write a response…

Show all responses