An Unknown Signal Report

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1 Equations for linear regression

For a set of points that lie along a line with Gaussian noise $\mathbf{y} = \mathbf{X}\mathbf{w} + \epsilon$ where $\epsilon_i \sim \mathcal{N}(0, \sigma^2)$, the maximum likelihood esimation is equivalent to the least square error estimation and is given by the equation

$$\hat{\mathbf{w}} = (\mathbf{X}^\mathbf{T}\mathbf{X})^{-1}\mathbf{X}^\mathbf{T}\mathbf{y}.$$

I've implemented this equation in my code as the following:

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your
code
example
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2 Choice of polynomial order

3 Choice of unknown function

4 Procedure for determining function

5 Overfitting

6 Testing